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Main articles (9)

G. SARTON *(Cambridge, Mass.)*.—Preface to Volume XXXI. *Quousque tandem?* 6
A. M. SAYILI *(Cambridge, Mass.)*.—Was IBNI SINA an Iranian or a Turk? 8
B. C. PATTERSON *(Clinton, N. Y.)*.—The Artificial Arithmetick in Decimals of ROBERT JAGER (LONDON, 1651) (1 fig.) 25
D. STIMSON *(Baltimore, Md.)*.—Amateurs of science in 17th century England 32
C. A. CROMMELIN *(Leiden)*.—Eine astronomische Handschrift aus dem 17. Jahrhundert 48
H. J. J. WINTER *(New Abbot, England)*.—Scientific notes from the early minutes of the Peterborough Society, 1730-1745 (2 fig.) 51
R. P. BIGELOW *(Cambridge, Mass.)*.—HARRY WALTER TYLER (port.) 60
R. F. JONES *(St. Louis, Mo.)*.—Puritanism, Science, and Christ Church 65
L. THORNDIKE *(New York, N. Y.)*.—A hitherto unnoticed criticism of astrology 68

Notes and Correspondence (3)

Question no. 83.—L'auteur et l'histoire de *Roti-Cochon* (G. S.) (3 fig.) 79
History of Science Society. Sixteenth annual meeting 82
Program History of Science Dinner Club (San Francisco, 1938-1939) 82

Reviews (19)

IVth Century B.C. STRÖMBERG, R.—Theophrastea, Studien zur botanischen Begriffsbildung. Göteborg, Elanders Boktryckeri, 1937 (L. EDELSTEIN) . . 83

XVIIth Century LANGDALE, A. B.—PHINEAS FLETCHER. New York, Columbia University Press, 1937 (C. A. KOFOID) 86

ORNSTEIN, M.—The rôle of scientific societies in the XVIIth century. Chicago, University of Chicago Press, 1938 (A. R. GOLDSMITH) 87

Observationes anatomicae selectiores, Amstelodamensium. 1667-1673. Ed. by J. F. COLE. University of Reading, 1938 (J. B. DE C. M. SAUNDERS) 90

XVIIIth Century VAN DOREN, C.—BENJAMIN FRANKLIN. New York, Viking Press, 1938 (I B. COHEN) . . 91

XIXth Century CRESSY, E.—A hundred years of mechanical engineering, New York, MACMILLAN, 1937 (D. C. JACKSON) 94

Egypt OMAR TOUSSOUN (Le Prince).—Les missions scientifiques à l'époque de MUḤAMMAD ʿALÎ, de ʿABBÂS AL-ANWAL et de SAIʿD. Alexandrie, ṢALÂḤUDDÎN, 1934 (G. SARTON) (1 fig.) . . 95

Babylonia CONTENAU, G.—La médecine en Assyrie et en Babylonie. Paris, MALOINE, 1938 (S. GANDZ) 99

Middle Ages HOPPER, V. F.—Medieval number symbolism. New York, Columbia University Press, 1938 (S. GANDZ) 101

India VAN WIJK, W. E.—Decimal tables for the reduction of Hindu dates from the data of the Sūrya-Siddhānta. The Hague, M. NIJHOFF, 1938 (A. POGO) 103

Islam ZAKI ALI.—Islam in the world. Lahore, M. ASHRAF, 1938 (D. B. MACDONALD) . . 104

Science, Philosophy FRIEND, J. W., FEIBLEMAN, J.—What science really means. London, ALLEN & UNWIN,

1938 (M. F. ASHLEY-MONTAGU) 105

Mathematics ENRIQUES, F.—Le matematiche nella storia e nella cultura. Bologna, ZANICHELLI, 1938 (C. D. HELLMAN) 108

Astronomy WATERFIELD, R. L.—A hundred years of astronomy. New York, MACMILLAN, 1938 (N. T. BOBROVNIKOFF) 109

Technology BURLINGAME, R.—March of the iron men. New York, SCRIBNERS, 1938 (C. A. KOFOID) . . 112

Botany ÅKERMAN, Å., GRANHALL, I., NILSSON-LEISSNER, G., MÜNTZING, A., TEDIN, O.—Swedish contributions to the development of plant breeding. Stockholm, BONNIERS, 1938 (C. A. KOFOID) 113

BOWER, F. O.—Sixty years of botany in Great Britain (1875-1935). New York, MACMILLAN, 1938 (C. A. KOFOID) 114

MERRILL, E. D., WALKER, E. H.—A bibliography of Eastern Asiatic botany. Jamaica Plain, Mass., 1938 (C. A. KOFOID) 115

Psychology GARDINER, H. M., METCALF, R. C., BEEBE-CENTER, J. G.—Feeling and emotion. New York, American Book Co., 1937 (C. A. KOFOID) 116

Isis Report for 1938 (G. S.) 118

Fifty-seventh Critical Bibliography of the History and Philosophy of science and of the History of Civilization (to May 1939) *(*1160 *items contributed by* 19 *scholars)* 121

Preface to Volume Thirty-One

Quousque tandem ?

At the end of his great book on *The Malay Archipelago* (1869), ALFRED RUSSEL WALLACE wrote (1) :

" A deficient morality is the great blot of modern civilization, and the greatest hindrance to true progress.

" During the last century, and especially in the last thirty years, our intellectual and material advancement has been too quickly achieved for us to reap the full benefit of it. Our mastery over the forces of nature has led to a rapid growth of population, and a vast accumulation of wealth; but these have brought with them such an amount of poverty and crime, and have fostered the growth of so much sordid feeling and so many fierce passions, that it may well be questioned whether the mental and moral status of our population has not on the average been lowered, and whether the evil has not overbalanced the good. Compared with our wondrous progress in physical science and its practical applications, our system of government, of administering justice, of national education, and our whole social and moral organization, remains in a state of barbarism. And if we continue to devote our chief energies to the utilizing of our knowledge of the laws of nature with the view of still further extending our commerce and our wealth, the evils which necessarily accompany these when too eagerly pursued, may increase to such gigantic dimensions as to be beyond our power to alleviate.

" We should now clearly recognize the fact, that the wealth and knowledge and culture of the *few* do not constitute civilization, and do not of themselves advance us toward the ' perfect social state.' Our vast manufacturing system, our gigantic commerce, our crowded towns and cities, support and continually renew

(1) My quotation is taken not from the English princeps but from the American one published in the same year (p. 597).

a mass of human misery and crime *absolutely* greater than has ever existed before. They create and maintain in life-long labor an ever-increasing army, whose lot is the more hard to bear, by contrast with the pleasures, the comforts, and the luxury which they see everywhere around them, but which they can never hope to enjoy; and who, in this respect, are worse off than the savage in the midst of his tribe.

"This is not a result to boast of, or to be satisfied with; and, until there is a more general recognition of this failure of our civilization—resulting mainly from our neglect to train and develop more thoroughly the sympathetic feelings and moral faculties of our nature, and to allow them a larger share of influence in our legislation, our commerce, and our whole social organization—we shall never, as regards the whole community, attain to any real or important superiority over the better class of savages.

"This is the lesson I have been taught by my observations of uncivilized man. I now bid my readers—Farewell!"

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This statement is interesting because of its date. It anticipated not only the evils of the Great War, but even those of the Franco-Prussian war and the Prussian hegemony which followed. However, WALLACE's statement is far truer today than it was seventy years ago.

Cambridge, Massachusetts
June 13, 1939.

GEORGE SARTON.

Was İbni Sina (1) an Iranian or a Turk?

The ninth centenary of İBNİ SİNA's death was celebrated in Turkey on June 21, 1937. An investigation was made during the previous year in order to fix the date of this celebration (2). The event brought forth the publication of a book, entitled *İbni Sina*, under the auspices of the Turkish Historical Society (3).

This work appears to me as a valuable contribution to the history of Moslem science and philosophy. The text is well substantiated by footnotes, and there are abundant references to original sources. Because of its dependence on primary source material, *İbni Sina* is a fresh and welcome addition to our knowledge of the great Moslem scientist. It is composed of a number of papers, mostly monographic, by different writers. These articles are grouped into six sections, the first of which is devoted to İBNİ SİNA's metaphysics and his nationality (4). It is to the

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(1) The spelling of the oriental words in this article is made according to the Turkish rules. The name of İBNİ SİNA (AVICENNA in its Latinized form) is written IBN SİNÂ by western orientalists.

(2) The results of this investigation were announced in the following article : A. SÜHEYL ÜNVER, Türk hekim ve feylosofu İBNİ SİNAnın doğum ve ölüm yılları ay ve günleri, *Tedavi Kliniği ve Laboratuvarı dergisi*, VI, 21, 1936, pp. 63, 64, 65.

(3) *İbni Sina, Şahsiyeti ve eserleri Hakkında tetkikler*, Türk tarih Kurumu Yayınlarından : VII. seri—n° 1, Muallim AHMET HALİT Kitab Evi, Istanbul, 1937. A review of *İbni Sina* by A. ADNAN has appeared in *Archeion*, XIX, 4, pp. 414-14.

(4) I indicate roughly the subject matter of the remaining sections : the second section (201 pp.) deals with medicine, the third (25 pp.) with astronomy and mathematics. The fourth section (21 pp.) contains certain literary works of İBNİ SİNA, and for the rest, consists of contributions to our knowledge concerning the folklore that has grown around İBNİ SİNA. The fifth section (223 pp.) contains selected translations. After these sections ninety-five pages are devoted to listing the works of İBNİ SİNA and an additional sixteen pages contain thirty-five illustrations concerning him. This bibliography of İBNİ SİNA which has been compiled under the direction of OSMAN ERGİN is, no doubt, one of the most valuable

latter topic that our attention is mainly directed, and the material of the remaining five sections will be drawn upon only in so far as it pertains thereto.

At this point I should like to answer those who query the value of discussing the nationalities of past scientists. These objections fall into two heads. The first states that the nationality of any scientist is irrelevant since science oversteps national boundaries. I agree, and the evidence supporting such an objection can be drawn from the history of science itself : no nation or race has enjoyed a monopoly of scientific discoveries; in the chain of these contributions to the scientific knowledge successive links frequently are supplied by men not of the same country; even in independent and simultaneous discoveries often more than one nation is involved. But all this evidence reducing the importance of nationality in the history of science is itself based on a knowledge of nationalities. Therefore the objection is justified only by a study of what it considers unnecessary. Besides, to many historians of science the human side of their study is interesting and it is not customary to omit reference to the nationality of scientists. Therefore attention to nationality is consistent with general practice in the history of science.

The second objection states that it is meaningless to speak about nationality prior to the emergence of nationalistic feelings. As a matter of fact it is well known that for a Moslem of İBNİ SİNA's day what was important was his faith and not his nationality. This makes the task of determining nationality the more difficult, but it ought not make it futile. For when we assign a nationality to İBNİ SİNA we do not assume a feeling of nineteenth century nationalism in our scholar; we only mean to imply a certain ethnological origin and membership in a group roughly describable as Iranian (5), Turkish, Arabic, and so forth. It should also be added that attribution of nationality to the Moslem scholars is

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parts of *İbni Sina*. It deals with the works of İBNİ SİNA, commentaries on them, and oriental translations of them existing in the libraries of Istanbul. BROCKELMANN has made use of this list in his supplement to the first volume of his *Geschichte der Arabischen Litteratur*.

(5) Throughout this paper, by Iranian I mean the descendants of the pre-Islamic Iranians.

consistent with the general procedure in the history of science. For would not the same objection hold in the case of European scholars who wrote in Latin, and other scientists who lived in the centuries before the emergence of nationalistic feelings? As a matter of fact Moslem scholars are assigned to nationalities by the historians of science. Besides, it is definitely wrong to say that it is absurd to talk about the nationality of a man of İBNİ SİNA's

time, because, it was the custom in that time to classify people into national, linguistic, and political groups (6).

The nationalities which western scholarship has assigned to the Moslem thinkers who flourished in the eastern parts of the Darülislam in medieval days are in conflict with those which contemporary Turkish opinion offers. I propose to discuss this conflict first generally; then particularly, as exemplified in the case of

(6) A third objection which may be raised to the way nationality of scientists is studied in this paper is that even if the nationality of any particular scientist is both relevant and determinable it is still unimportant unless one can show that the intellectual climate, indispensable for the development of any scientific genius, was built up by other men of the same nationality. It is beyond the scope of this paper to deal with this objection. An answer to it, however, may be found on p. 11.

İBNİ SİNA. The discussion is based mostly on recent Turkish publications, especially on an article of ŞEMSEDDİN GÜNALTAY (7).

The contemporary Turkish students of history claim that the determinations of the nationalities of the eastern Moslem scholars as set forth in western publications contain exaggerations in two directions; namely, in the attributions of the Arabic and the Iranian nationalities. The Arabic assignations have been noticed and corrected to a great extent; the emphasis in this paper is therefore on the second kind of exaggeration.

Let us first consider the linguistic criterion for the determination of nationality as applied to Arabic. Arabic was the scientific language of all the scholars of the Moslem world. As a matter of fact Arabic was not just a scientific language, it was also, like the Moslem faith, a common bond which held together the people of the Moslem domain from the Indus to the Atlantic, which contained very diversified nations and races. The translation of the Koran was forbidden. There is also a tradition *(hadis)* which indirectly attributes a definite preference to Arabic : " Love the Arab for three reasons : because I am an Arab, because the Koran is in Arabic, and because the language of paradise is Arabic " (8). Since Arabic was the scientific tongue, non-Arabs as well as Arabs, scholars of other faiths as well as Moslems, all had recourse to Arabic as the language used for scholarly pursuits. The status of Arabic in the Moslem lands was similar to that of Latin in Europe. So, although the parallelism is not complete, one would be justified to say, by way of analogy, that as BEDE, ALEXANDRE DE VILLEDIEU, JORDANUS NEMORARIUS cannot be called Latin or Roman or Italian because they wrote in Latin; in the same way Moslem scholars cannot be called Arabic simply because they wrote in Arabic (8*a*). Such terms as " Arabic scientists " and

(7) ŞEMSEDDİN GÜNALTAY, İBNİ SİNA, Milliyeti, Hayatı, Kültürü, *İbni Sina*, section 1.

(8) The question of the accurateness of a tradition is a complicated one. It is mainly a problem of tracing the tradition back to the Prophet. Some traditions were introduced in later times, and it is not always easy to distinguish between the true traditions and the later fabrications.

(8*a*) Among the Moslem scholars those of the Arabic nationality seem to be relatively small in number. Examples of contemporary complaints that the

"Arabic culture," therefore do not seem to be very appropriate ones. These terms, if correctly used, refer to the fact that the scientific literature was in Arabic, not that the heroes of this achievement were all Arabs. But this defined use of the term is apt to be misleading since " Arabic " has other connotations than the linguistic. The terms " Moslem scientists " and " Moslem culture " (9) seem preferable even if they would seem to leave out the Christian, Jewish, and other non-Moslem scholars of this period (10); because the word Moslem also refers to the entire realm in which these scientists flourished, not only to their faith. There is, also, no doubt that the fusion and contact of different nationalities as a result of the advent of the Moslem faith were important factors in the emergence of the intellectual activities of this period. Therefore it should seem most reasonable if the word Moslem were brought into prominence.

The great majority of Moslem thinkers that Turks today claim for themselves lies in the group normally called Iranian rather than in that called Arabic; and the factors making for the confusion of Turks and Iranians form the basis of the discussion which follows. One factor is the uncritical acceptance by the western scholars of all peoples to the east of the Tigris as Iranians. Apparently the reason for this, in many cases, has merely been that these Moslems were obviously not Arabs. The entire region

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Arabs were a small minority among the Moslem physicians may be found in pp. 6, 7, 8 of *Arabian Medicine* by E. G. Browne, 1921.

Talking of al Kindi (died c. 873), Sarton calls him the only great philosopher of the Arab race (*Introduction to the History of Science*, I, 559).

(9) These terms, which are systematically preferred by the contemporary Turkish scholars, are the ones used in this paper.

(10) It would be interesting in this connection to determine the following numerical ratios : 1) non-Arab scientists to Arab scientists, 2) non-Moslem scientists to Moslem scientists, 3) Works written in Arabic to those not written in Arabic. A comparison of (1) with (2) would give us an idea of whether it would be greater injustice to non-Arab scientists when the term Arabic scientists is used or greater injustice to non-Moslems if the term Moslem scientists is used. A comparison of (2) with (3) would, on the other hand, show which of the following is preferable on merely quantitative considerations : to use the term Moslem scientists which would exclude the non-Moslems, or the term Arabic scientists which would not include, at its best, the works not written in Arabic. The data available at present for such a statistical survey, however, do not appear accurate enough to make reliable the results that might be derived from them.

could never have been Iranian because the pre-Islamic Iranian empire had definite eastern boundaries beyond which was Turkistan. The boundaries of pre-Islamic Iran might be a rough guide for distinguishing Iranian from Turk for, let us say, the first century or century and a half after the Moslem domination in these parts. In the later centuries of the Moslem domination, however, Turkish migrations into Iran took place and several Turkish states were established there. The Turks became scattered in great numbers over this country (with the possible exception of its southern parts), and apparently with a dense population (11). After such infiltration it would, of course, not be accurate to conclude that a scholar is Iranian, just because he originated in the countries today called Iran. For investigations of this nature it would be useful to differentiate between the urban and the rural populations. All in all, in these later times, it is far from simple to determine the nationality of a man who was born or who lived within what are today the political boundaries of Iran. The problem becomes very complex especially when no sources are found mentioning specifically the man's origins. In such cases where geographical considerations only are available as guides for determination of nationality, and particularly in later times when the Turks and the Iranians were thoroughly mixed in their geographical distribution, the problem becomes well-nigh insoluble. Nevertheless, assignments of nationality are made on rather doubtful grounds. Unless a man from Horasan or Harezm, for instance, has ancestors with incontestably pure Turkish names he is usually considered Iranian. Only FARABI (d. 950-51) is generally considered to be a Turk, for the names of his ancestors, both on his mother's and his father's side, are Turkish. This method, however, is not always applied with equal insistence in deciding on an Iranian nationality. Pure Persian names such as *Hürmüz* and *Rüstem* are not necessarily required, but they should be required because in many cases, the non-Moslem ancestors of Iranians would not even be more than two generations earlier than those of the Turks. So that there seems to be inconsistency in the application of this method.

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(11) The fact that Asia Minor, lying still more to the west, acquired its Turkish features very rapidly supports this point of view.

In the general dilemma, knowledge of the Persian language is taken to be evidence for Iranian nationality. However, this linguistic consideration is not always a valid criterion, because Persian became a fashionable tongue; Turkish rulers such as the Selçuki and Gaznevi kings tended to favor the usage of Persian in their courts, and surrounded themselves with Persian poets. Some of these kings preferred Persian titles to their Turkish names. This is true even in the case of the Anatolian Selçukis (12). Even SELİM I, the Ottoman Emperor (1512-1520), and many Ottoman men of letters continued to be fond of writing in Persian. There is evidence that among the Persian poets many were of Turkish origin. The impression one would get from the literature handed down from those days is that these people never used the Turkish tongue. However, there are clues suggesting that it would not be correct to assume that they did not use this language in ordinary conversation. For example, we have a reproduction in Persian of a conversation between REŞİD EL DİN VATVAT, a Persian poet, and ATSIZ, his interlocutor. From the text we would assume that the talking was done in Persian were it not for the inclusion of a pun which makes no sense unless it was made in Turkish (13). MEVLANA CELAL EL DİN EL RUMİ, who is well known for his *mesnevis* written in the Persian language, is considered to be an Iranian; whereas he states clearly, in one poem at least, that he is a Turk(14). Further examples of this nature and other works devoted to similar topics also exist (15). It has also been shown by FUAT KÖPRÜLÜ that the stanza (the *kıta* of Islamic poetry) formed a unit in pre-Islamic Turkish poetry, and suggested by KOWALSKİ that *rubai*, the form in which ÖMER HAYYAM usually chose to write, is derived from this Turkish stanza (16).

It was said above that the Persian language gained preëminence over the Turkish, and that a disposition towards exhibiting or adopting Persian features and appearances by Turks was sometimes

(12) See, e.g., İSMAİL HABİB, *Türk Teceddüd Edebiyatı Tarihi*, p. 11 (first edition).

(13) Preface by ABDÜLBAKİ GÖLPINARLI to the following work : *Tıb İlmi ve Meşhur Hekimlerin Mahareti*, Istanbul Üniversitesi Yayımlarından, no. 32.

(14) *Loc. cit.*

(15) *Loc. cit.*; also M. FUAT KÖPRÜLÜ, Gazneliler devrinde Türk Şiiri, Türk Dili ve Edebiyatı Hakkında Araştırmalar, pp. 26-32.

(16) FUAT KÖPRÜLÜ, Türk Edebiyatına bir Bakış, *Birinci Türk Tarih Kongresi*, p. 319.

observed. It seems to me that all these may be due to the following reasons (17) : Iran as a whole came under the rule of the Moslems at one stroke and therefore came to be considered as a part of the Darülislam; whereas the Turks offered much resistance to the conquering Moslems and also to the spread of the Moslem religion, and their lands fell under the Moslem domination only gradually, and with ebbs and flows, until the beginning of the eighth century; and after this time only part of Turkistan was annexed to the Moslem lands. As a result the term Turkistan came to mean the as-yet-unconquered portion of Turkistan, while the regions of it incorporated in the Moslem domain were considered as merely a part of the Moslem realm. As conquests pushed the frontier of the Moslem lands to the east, in the mind of the Moslems the western boundary of Turkistan shrank accordingly (18). To the Moslem, Turkistan apparently carried merely a geographical connotation, for the parts of the old Turkistan which had been included in the Moslem domain together with its Turkish inhabitants were no more referred to as Turkistan. Turkistan was the unconquered land to the northeast of the Moslem realm containing the infidels (19). These infidels were Turks and were referred to as Turks, and it seems, Moslem and Turk thus came to be considered generally as mutually exclusive terms (20). This situation must have been enhanced by the fact

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(17) The development of an anti-Arab (mainly in the racial sense) feeling should also be considered in this connection (see p. 11).

(18) We may roughly define the southwestern boundary of Turkistan, at the period of the rise of Islam, by considering it to pass from the vicinity of Dehistan, to exclude Merv and to include Belh (see p. 13 and footnote 30). To the Moslems of the following centuries, however, Turkistan was beyond Seyhun. Thus, e.g., YAKUT AL HAMAVÎ (1179-1229) considers Turkistan to start with Farab (*Kitab Mucem el Buldan*, I, p. 839) and Kasan in Fergana. (op. cit. IV, p. 227). The maps made by the Moslem geographers are not of value to us on this subject.

(19) It is interesting to note that in giving the boundary of Turkistan, YAKUT uses the expression (the border between) " the side of the Moslems and Turkistan." (*Op. cit.* I, p. 839).

(20) One sees this idea reflected in the following couplet of ŞEYH SADÎ, in *Gülistan :*

I am afraid you shall not reach the Kâbe oh Arab,
This way you are going leads to Turkistan.

(*Gülistan*, ch. 2, sixth story). These words are addressed to a person who was the guest of a king and who, on this occasion, contrary to his everyday habits, observed good table manners and performed the sufficient number of prayers

that Turks adopted the new faith only gradually. Under these circumstances, and since the non-Moslem Turk continued to exist and to be referred to as Turk, it was natural that a Moslem Turk would prefer to omit reference to his being a Turk.

It had been said above that Arabic was the international scientific language of the Moslem realm, and that Persian was a language that gained preëminence especially as a literary tongue. All this, however, was of course in no wise indicative of the language used by the masses of the people. It does not mean that Turkish

as a good Moslem should. The words Kâbe and Turkistan are both used figuratively. Kâbe, of course, represents a place where everything good from the viewpoint of a Moslem is found, a place where the Moslem spirit is represented at its best; and Turkistan thus becomes a place which embraces things not sought by a devout Moslem.

Other literature also exists which suggests that to the Moslem, being a Turk was not reconcilable with the Moslem faith, or that being called a Turk was not desirable. A few examples are given below. The following statements, e.g., are ascribed to the Prophet : " The Turks will be the first people to deprive my nation of what they already have "; " The post of being caliph will be always in my nation until the Turks come and defeat them "; " Leave the Turks alone as long as they leave you alone." (YAKUT, *op. cit.*, I, 838). These statements must have been introduced after the subjugation of Iran, and the authority of MOHAMMED must have been put behind them in order to make this negative propaganda more effective. For, it is very unlikely that MOHAMMED knew anything about the Turks. " Leave the Turks alone as long as they leave you alone " is also attributed to MUAVİYE (*loc. cit.*) and one can see clearly why MUAVİYE should make such a statement. As a matter of fact the Moslems had found out, ever since the sudden downfall of Iran (with the victory of Nihavend which was called Feth el Futuh, i.e., the victory of victories, by the Arabs), that it was very difficult to subjugate the Turks. Among the later descriptions of the border towns we meet statements which indicate how the Moslem inhabitants in these regions had to be on their guard against the Turks. Thus in a description of the vicinity of Merv we meet the following account : " ...each house had a fort in which the people of the house sheltered themselves from the Turks whom they expected to come and want to enter some of these houses." (EL YAKUBİ, *Kitab el Buldan*, ed. : M. J. DE GOEJE, Bibliotheca geographorum Arabicorum, Leiden, 1892, vol. VII, p. 279). Also, talking about the city of Vaşacird, it is said that it has seven hundred strong forts built because of the struggles the people of this city used to have with the Turks. (*op. cit.*, p. 292) (See also footnote 30 for another similar example). During some twenty years which elapsed between the victory of Nihavend and MUAVİYE's coming to power, the new Empire had a lot of trouble in dealing with the Turks. Turkish rulers recaptured many times the parts previously conquered by the Moslems. The statement of MUAVİYE quoted above, becomes more significant when we consider that a similar Turkish conquest occurred during the reign of MUAVİYE. It was also MUAVİYE who, in order to put an end to the transitory nature of the Moslem conquests in the land of the Turks, sent some fifty thousand Arabs from the regions of Bagdad and Basra to settle in Horasan.

was not employed for purposes of recitation in classrooms either. There is, in fact, sufficient evidence to support the view that Turkish was being used as such (21).

There is another source of confusion, which is of a philological order, and tending again to favor an unjust assignment of Iranian nationality, and this is the word *acem*. *Acem* originally used to mean non-Arab (22); IGNAZ GOLDZIHER, for instance, translates this word by Nichtaraber (23). Later on, however, the word *acem* came to mean Iranian only. It is, therefore, a mistake to translate the word *acem* as Iranian without considering the period in which this word had been used (24). Before the word *acem* came to mean Iranian exclusively, it designated Moslem Turks as a group for a longer time than any other non-Arabic group. This was natural, because the lands of the Turks and the Iranians were in the same general region; the Turks and the Iranians were intermixed to a great extent in their geographical distribution; and the term Turk had been devoted more or less to the non-Moslem Turks. The word Iranian (or Persian, in its now discredited form) as met in the modern works on the medieval

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(21) A. SÜHEYL ÜNVER, Orta Zamanda Türkçe Takrir üzerine Kısa bir Mülahaza, *Tedavi Kliniği ve Laboratuvarı*, vol. VII, no. 27, 1937.

(22) A. SÜHEYL ÜNVER, İslam Tababetinde Türklerin Mevkii Hakkında, *Türk Tıb Tarihi Arkivi*, I, 3, 1935, p. 103. See also *Encyclopaedia of Islam*, word 'ADJAM.

(23) *Vorlesungen über den Islam*, 1925, p. 134.

(24) For example, talking about Bohara, YAKUBİ says, "Its population is a mixture of Arabs and *acems*." (*Op. cit.*, p. 292). This example by itself is sufficient evidence that the word *acem* here should not be interpreted as Iranian, but as containing other non-Arab elements; because Turks constituted the majority of the population in these districts. However, we can also confirm this interpretation by observing that, when he talks about certain cities in Palestine and Transjordania too, he says that the population of the city is a mixture of Arabs and *acems* (*op. cit.*, p. 328). On the other hand we also meet the word Turk in the text of YAKUBİ. He uses this word mostly when talking about the Turks that were outside the Moslem territory, but he sometimes uses it referring to the cities within the Moslem realm too. (*Op. cit.*, p. 262). For that matter he also uses the word *Fars* (*op. cit.*, p. 327) for Iranians as distinguished from *acem*. The explanation is that when he does not go into details he uses the word *acem* in order to cover non-Arabs, but when he describes the population in detail then he refers to different peoples by mentioning the place or city from which they originated.

In the same way, NASİRİ HUSREV, in his *Sefer Name*, uses the word *acem* many times. When his statements are more detailed, however, he uses the words, *Fars* and Turk, both. (e.g., pp. 46, 85, ed. 1881, Paris).

Moslem culture, can only be considered as correctly used if it is agreed that it has approximately this last mentioned meaning of the word *acem*.

There is one other guide sometimes used for the attribution of an Iranian nationality; namely, if a man is shiite this is considered as an indication for his being Iranian. The applicability of this reasoning is of course limited because even if it be granted (taking into account the necessary geographical considerations) that most shiites were Iranians, not all shiites were Iranians. There were also many shiite Turks. Iranians and shiites were two different groups though they overlapped to a great extent. It must also be kept in mind that shiites hated sunnis, and that this denominational bond was even as effective as the linguistic one in tying groups of people together.

Some attention should be paid also to the şuubiye (25) movement. Şuubiye, broadly speaking, was an attempt to distinguish between Arabism and Islam. More particularly, this revealed itself as an antagonism between Iranians and Arabs, with a considerable amount of corresponding literature (26). All this helps bring to our attention the existence of an Iranian group, and helps to differentiate non-Arabs from Arabs; but it complicates matters as far as differentiating among these non-Arabs, the Iranians from those who were not Iranians.

Thus far, I have endeavored to give a general idea of the difficulties encountered in determining the nationality of the scholars of the eastern parts of the Moslem domains. This has been done with special emphasis on the aspects of this question which tend to minimize the role played by the Turks. In doing this, I have limited myself to a discussion leading to a claim that there was a greater percentage of Turkish stock among Moslem scientists than is generally supposed. ŞEMSEDDİN GÜNALTAY, in his article mentioned above (27), touches this problem, but he covers a more general ground; he also adduces evidence that the older civilization of the Turks helped build Moslem culture and science,

(25) *Encyclopaedia of Islam*, IV, 1927, SHU'UBİYA.

(26) GEORGE SARTON, *Introduction to the History of Science*, I, pp. 524, 534, 541, 645, 687.

(27) See footnote 6.

and that the Turks played a certain part in the initial impetus which gave rise to the intellectual movement of the Moslem community.

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For a long time İBNİ SİNA was considered an Arab. At the present the most widely accepted opinion seems to be that he is Iranian. The contemporary Turkish scholars, however, consider him to be a Turk.

The name of İBNİ SİNA's great-great-grandfather was SİNA, and his father's name was ABDULLAH. ABDULLAH was from the city of Belh, and he came to Bohara during the reign of NUH İBNİ MANSUR (976-997), one of the Samani rulers. Having won the confidence and appreciation of the viziers of the Emperor, ABDULLAH was first given a position in Bohara, and later was transferred by promotion to Kormisen, one of the dependencies of Bohara. İBNİ SİNA's mother was from the village of Afşene, in the vicinity of Kormisen (*27a*). There are no statements specifying İBNİ SİNA's nationality among the contemporary records (28). It is certain, however, that İBNİ SİNA was not an Arab, and in the following we shall try to determine his nationality. This will consist mainly of a summary outline of Ş. GÜNALTAY's treatment of the problem. First he makes a detailed study of the ethnic physiognomy of Belh and Bohara (i.e., the cities of the father and mother of İBNİ SİNA), and the regions surrounding them. The conclusion reached is that these regions were Turkish at the time when the conquering Moslems reached them, and had been Turkish (29)

(*27a*) A translation, into Turkish, of İBNİ SİNA's autobiography with a large number of valuable footnotes is presented by M. ŞEMSEDDİN YALTKAYA in the fifth section of İBNİ SİNA.

(28) A. SÜHEYL ÜNVER, Türk tababeti tarihi simalarından İBNİ SİNA, p. 1, *Tedavi Seririyatı ve Laboratuvarı*, I, no. 4, 1931.

(29) The word Turk here does not refer only to the people within the boundaries of the Tukyu Empire. It includes, for instance, the Ephthalites and the Kushans. This definition of the word Turk is based on information obtained from ancient sources, especially Chinese, concerning the relationship of these peoples. It is also amply justified by the Moslem usage of the word Turk when talking about the early periods of their conquests in these regions. Also, the word Turk, as it came into usage later on, means more than the people originating from the Tukyu Empire. Turks set up in different times and locations many states with different

for many centuries before (30). This conclusion is reinforced

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names, and one of these is Tukyu. Even if one insists in associating the Turks with a name phonetically similar to " Turk," there is justification for considering Tukyu as not comprising all Turks. For, there are other similar sounding names. One of the oldest and less frequently mentioned of these is Ti or Dik (" r " being omitted as it always is in Chinese). J. EDKINS, *Journal of the China Branch of the Royal Asiatic Society*, XXII/1887, p. 228; and, O. FRANKE, Beiträge aus Chinesischen Quellen zur Kenntnis der Türkvölker und Skythen Zentralasiens, p. 13, note 1, *Abhandlungen der Königlich Preussischen Akademie der Wissenschaften*, 1904; also, HÜSEYN NAMIK, Türk adının eskiliği, *Ülkü*, 1934, III, 17, pp. 344 ff.; Türk adı, *Ülkü*, 1933, II, 7, pp. 26 ff.; 1934, III, 15, pp. 195 ff.).

Here are some other examples : Türkeş, Türkmen, Turuşka, Turan. (Other examples may be found in FRANZ VON ERDMANN, *Temudschin der Unerschütterliche*, 1862, pp. 1-248 *passim*, and JOSEPH VON HAMMER, *Geschichte des Osmanischen Reiches*, 1828, I, p. 1 ff.).

Türkeş was the name of a state formed by Turks near the beginning of the eighth century. The Chinese version of this word is Tou-ki-che. (EDOUARD CHAVANNES, *Documents sur les Tou-Kiue (Turcs) occidentaux*, St.-Petersburg 1903, *passim*).

The Turkomans were known to the Chinese in the eighth century by the name of T'ö-kü-möng (FRIEDRICH HIRTH, *Sitzungsberichte der philos.-philol. und der hist. Classe der k. b. Akademie der Wissenschaften zu München*, 1889, II, 263).

In KALHANA's *Rajatarangini*, HUŞKA, JUŞKA, and KANİŞKA, Kushan kings, are said to be descendants of Turuşka (M. AUREL STEIN, *Kalhana's Chronicle of Kas'mîr*, vol I, p. 170); Turuşka is a term used also for designating the Tukyu kings in Sanskrit sources (Ş. GUNALTAY, *ibid.*, p. 14, footnote 3. See also A. STEIN, *op. cit.*, index in vol. II). The word Turuşka is the Sanskritized form of " Turk " which was pronounced as " Turukkhu " in the Middle-Indian tongue (EDWARD C. SACHAU, *Alberuni's India*, 1910. II, 361. See also A. STEIN, *op. cit.*, vol I, Introduction, p. 76).

Turan, which has also phonetic similarity with the word Turk, is the term by which the pre-Islamic Iraniens designated their northeastern neighbors; Turan is met in the *Şahname* of FİRDEVSİ and in the sacred literature of the Zoroastrian religion.

Generally speaking, however, most of the states formed by the Turks have names which bear no resemblance to the word " Turk ". In the later periods we do know that some of these states derived their names from their founders, e.g., the Selçuki and the Ottoman Empires.

(30) Ş. GÜNALTAY refers to Byzantine, Armenian and Moslem sources in order to establish this point. To these I will add the following which deal with the periods close to the Moslem establishment in these lands.

The Armenian SÉBÉOS (7th century of the Christian era) associates Turkistan with Dehistan or its immediate vicinity. (*Histoire d'Héraclius*, traduite de l'arménien et annotée par FRÉDÉRIC MACLER, Paris 1904, p. 63). Also according to him the Oxus river rises in Turkistan (*op. cit.*, p. 49). Turkistan as described here would certainly include Bohara and probably Belh also.

It is clear from a passage in BELAZÛRÎ that at the time of the Arabic conquest of Iran, Merv was on the boundary of Iran with the Turks, and that it belonged to Iran (EL BELAZÛRÎ, *Futuh el Buldan*, ed. M. J. DE GOEJE, 1886, p. 315). Merv

by a philological study of the names of these two cities and also of Afşene, which shows that these names were derived from Turkish words. On the basis of geographical considerations, the nationality of İBNİ SİNA would be more controversial on his father's side. Therefore a summary of the philological study concerning Belh will be chosen as an example here : the ancient name of Belh was Hanbalıg and later the part Han was dropped and only Balıg used. Later on Balıg was changed to Belh. Now, Han is a title used in pre-Islamic Turkish, and Balıg means city in Turkish. (The city of Urumçu on the northern side of Tienşan used to be called Beşbalıg. Also Peking, the old capital of China, was called Hanbalıg by the Turks during the period of Mongols).

Since Bohara, Belh, and their vicinity were inhabited by Turks,

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is more than 450 km. to the west of Belh and over 300 km. southwest of Bohara. Besides, as can be seen in the text, YEZDİ CİRD III considered NEYZEK, the Tarhan (a title given to nobles who originated from the common people) of the Turks, as a subordinate of his. Thus we see that at this particular time the Turks in the vicinity of Merv were not under a ruler as strong as that of the Iranians. Therefore it would be reasonable to suspect that regions populated by Turks also should fall within the official boundary of Iran around Merv. The references which follow justify such a consideration.

Talking about the conquest of Horasan by the Moslems, BELAZÛRİ says : İBNİ KAYS was sent to Kuhistan, and there the Hayatile met him. The Hayatile are Turks; and it is said that they were in Iran, but FİRUZ exiled them to Herat and thus they were with the Turks and gave assistance to the people of Kuhistan (*op. cit.*, p. 403).

This passage shows that at the time in question Herat was in the country of the Turks. It also shows us that Kuhistan was inhabited by Turks at the time of its conquest by the Moslems. Herat is over 350 km. south of Merv, over 500 km. southwest of Behl, and over 600 km. south of Bohara.

Also, BELAZÛRİ says that İBNİ HAZEM was governor over Horasan; in Horasan the Turks gathered together (for an insurrection), and he dispersed them (*Op. cit.*, p. 408).

TABARİ writes as follows : Belh and Kuhistan, where the Turks had become unruly again, were captured in the year 51 (TABARİ, *Tarih*, Leiden, 1883, second series, p. 156).

Kuhistan is a region generally associated with districts to the southwest of Nişabur and Herat.

YAKUT (*op. cit.*, I, p. 838) mentions a town in the vicinity of Merv. Its name is Turkan, and this word has apparently a philological affinity with the word Turk. So it may be considered as collateral evidence that the Turks lived around this region. (In this connection see pp. 13, 14 on the names of Belh, Bohara, and Afşene).

the geographical criterion acts as an indication in favor of İBNİ SİNA's and his parent's being Turkish.

İBNİ SİNA wrote a few small works in Persian (31), and no works of his were found in Turkish. This was looked upon as evidence of his being Iranian, and also of his not having known Turkish. However, as stated above, the fact that İBNİ SİNA knew Persian and wrote in Persian does not necessarily mean that he was of Iranian nationality. He may have written in Persian simply because this was the fashion of his time. Besides, there is some evidence that İBNİ SİNA knew Turkish; for, a Turkish stanza called " The stanza of EBU ALİ SİNA " has been brought to light (32). This is from a manuscript collection of about the end of the fifteenth century (Emiri Library, 685, folio 219). A photostat is appended to the article of KİLİSLİ RİFAT mentioned in footnote thirty-two. As seen in this picture, the phrase, " The stanza of EBU ALİ SİNA " is written on top, and below this the stanza itself is given. The last line is, " Such is this ALİ's advice." This is in conformity with the habit of the Moslem poets, namely, that the poet usually gives his name at the end of his poem; and this betrays the author as İBNİ SİNA himself. Therefore, it is not likely that " The Stanza of EBU ALİ SİNA " is merely a title for this poem. In the manuscript collection there is no note to the effect that the stanza was translated from Arabic or Persian, and no Arabic or Persian versions of the same stanza are known. Therefore, the available data make it necessary to accept that İBNİ SİNA wrote it in Turkish, and that it was transcribed or incorporated into the collection from some other place. Indeed it should not be unnatural, when we consider the evidence favoring İBNİ SİNA's being Turkish, that this Turkish verse is from the pen of İBNİ SİNA, and that he had written it in Turkish.

It was mentioned above that being shiite is sometimes looked upon as an indication in favor of a man's being Iranian. İBNİ SİNA was not a shiite (33); therefore this criterion is not in favor of his being Iranian.

(31) Certain Persian poems of İBNİ SİNA which had not appeared in print before are presented by M. ŞEMSEDDİN YALTKAYA in the paper " 'İBNİ SİNA' nın basılmamış şiirleri," in *İbni Sina*, section : İBNİ SİNA Folklorları ve bazı parçalar.

(32) KİLİSLİ RİFAT, İBNİ SİNAnın türkçe bir kıtası, *İbni Sina*, section İBNİ SİNA Folklorları ve bazı parçalar.

(33) A. SÜHEYL ÜNVER, *Türk Tıb Tarihi Arkivi*, 1935, pp. 104, 106.

One of the reasons why İBNİ SİNA has been called Iranian is that the word Sina has been considered a Persian word. Because " Sînâ " (as its pronunciation was assumed to be) with its two long vowels, phonetically possesses the characteristics of a Persian word. However, the *Kamus* (34) specifies the correct pronunciation of this word; it is with short " i " and short " a ". This fact shows immediately that the word is not Persian. When pronounced as specified in the *Kamus*, it acquires phonetically the qualities of a typical Turkish word. Besides, ŞEMSEDDİN GÜNALTAY shows that the word Sina is included in lists of Turkish personal names. Sina has a few possible meanings in Turkish (35), and in each sense, other derived words exist in the Turkish vocabulary, whereas in Persian no meaning can be assigned to this word except when with long " i " and long " a ". And in this case there is one meaning that can be given to it, and it is in the form of an isolated word and no other words derived from it exist.

So, in short, that İBNİ SİNA was not shiite is a secondary indication in favor of his being Turkish; also, it is not correct to say that he did not know Turkish; nor would it be correct to consider him Iranian just because he wrote some of his works in Persian and not in Turkish. His mother was from the vicinity of Bohara, a region which was well inside Turkistan and far from its boundary with Iran. Besides, İBNİ SİNA's mother was a country girl and therefore very likely belonged to the aboriginal population of this region. Belh, the city of İBNİ SİNA's father, was also a region inhabited by the Turks. But Belh was a fairly large city, and although the majority of its population must have been Turkish, around the time of İBNİ SİNA's father (36) one would expect also

(34) The *Kamus* is a big dictionary originally compiled by FİRUZ ABADİ (d. 1414). It was translated into Turkish during the reign of SELİM III (1789-1807), the Ottoman Emperor, by AYNTABLI ASIM.

(35) This word appears also in the Uygur vocabulary in the form of " Jaya Sina," a name given to wealthy people. The word " sina," in the form of a verb, is also seen in *Divani Lugatüttürk*, a Turkish book which was written by MAHMUD KÂŞGARİ in 1074 A.D. (Ş. GÜNALTAY, *ibid.*, pp. 18, 19).

(36) At the time of İBNİ SİNA's parents the countries where they lived were under Turkish rulers. The regions of Belh and Bohara were under the Samani kings who were Turkish (Ş. GÜNALTAY, *ibid.*, p. 7). From 962 A.D. on the Gaznevis ruled to the west and southwest of the Samanis, and the Gaznevi rulers also were Turkish.

to find foreigners, especially Iranians, in this city. "Sina" is a Turkish word and a Turkish name, however, and this, of course, greatly strengthens the possibility of İBNİ SİNA's being of Turkish origin on his father's side too.

To the preceding considerations concerning İBNİ SİNA's nationality, one could add the following observation : İBNİ SİNA's full name is EBU ALİ EL HÜSEYN son of ABDULLAH son of HASAN son of ALİ son of SİNA (37). Among these names of ancestors SİNA only reveals a pre-Islamic character. SİNA is four generations back (38), and this should not be more than one hundred and fifty years. İBNİ SİNA was born in 980 A.D.; therefore his great-great-grandfather must have lived not before 830 A.D. Iran was completely conquered before the middle of the seventh century. So, if İBNİ SİNA's ancestors on his father's side were Iranian, the non-Moslem stamp in their name could not have possibly been preserved for such a long time. Therefore, the fact that İBNİ SİNA's grandparents on his father's side preserved a pre-Islamic trace in their name until at least the beginning of the ninth century is also an additional indication that they were of Turkish origin.

(Harvard University.) AYDIN M. SAYILI.

(37) See, e.g., İBNİ EBİ USEYBİE, *Uyun el enba fi tabakat el etibba*, Königsberg, 1884, II, p. 2.

(38) From a reference such as that of İBNİ USEYBİE I would conclude that SİNA lived at least, and very likely, exactly four generations before İBNİ SİNA. In considering him actually four generations back, I rely on Ş. GÜNALTAY who says, in discussing the etymology of the word "sina" and on other occasions, that SİNA was the great-great-grandfather of İBNİ SİNA (*ibid.*, p. 18).

The Artificial Arithmetick in Decimals of Robert Jager (London, 1651)

The history of the decimal idea has been treated at length by G. SARTON (1). The first explanation of decimal fractions and measures is found in SIMON STEVIN's *De Thiende* (1585); and a French translation entitled *La Disme* was prepared and published by the author in the same year. In 1608 ROBERT NORTON translated *De Thiende* into English under the title *Disme: The art of tenths, or decimall arithmetike.* This seems to have the honor of being the first book on the subject in English.

Various books were published in England during the seventeenth century explaining the use of decimals. D. E. SMITH, in his *Invention of the Decimal Fraction* (2), mentions *The art of tens, or decimall arithmeticke*, by HENRY LYTE, London, 1619; and SARTON also refers to it in his paper. SARTON also mentions WILLIAM BARTON's *Arithmeticke abreviated. Teaching the art of tennes or decimals to worke all questions in fractions as whole numbers without reduction*, London, 1634. CAJORI (3) discusses the decimal notation as it was used in the seventeenth century, and refers to other English authors and their books.

Several years ago the Hamilton College Library acquired a copy of a little book entitled : *Artificial Arithmetick in Decimals*, by ROBERT JAGER, Gent., London, 1651. It is about 10 × 14.5 cms. in size and contains XIV + 256 pages; in several instances the pagination is incorrect. In searching for information concerning this book we have found that it is mentioned by CAJORI, l. c., p. 325; that it is listed in WATT's *Bibliotheca Britannica*; that there is a copy in the British Museum; and that the author is listed in ALLIBONE's *Dictionary of Authors*, with the single fact

(1) *Isis* 23, 153-244, 1935.
(2) *Teachers College Bulletin*, 1st ser., no. 5, 1910.
(3) History of Mathematical Notations, vol. 1.

that he wrote on decimals in 1651. The Union Catalog of the Library of Congress records only one other copy, located in the New York Public Library. Of this copy the title page is mutilated and many leaves are missing.

ARTIFICIAL
ARITHMETICK
IN
DECIMALS:
Shewing the Originall, Ground,
and Foundation thereof: With the Quinteſſence of the GOLDEN RULE, the true valuation of all *Annuities*, and ſolution of all difficult *Queſtions* of that nature.

Alſo to finde a Diſtance at one Station, an Art never till of late invented, and not till now Publiſhed.

Together with diverſe Uſes and Applications thereof, very uſefull and neceſſary for Gunners, Sea-men, *and* Surveyors of Land.

By ROBERT JAGER, Gent.

Infœlix, cujus nulli ſapientia prodeſt.

LONDON:
Printed by *Robert* and *William Leybourn*, for *Humphrey Moſeley*, and are to be ſold at his Shop in St. *Pauls* Church-yard, at the ſigne of the Princes Arms: *MDCLI.*

Actual size of printed page is 8.3×13.5 cms.

CAJORI indicates that he had not seen the book but drew his information from an article by DE MORGAN (4). We quote DE

(4) *On some Points in the History of Arithmetic*, in The Companion to the British Almanac, London, 1851, pp. 12, 13.

MORGAN : " Though the system [of decimals] was hardly settled in 1650, its invention was in dispute... It is by no means unlikely that more than one, upon such hints as were current, had constructed a system more or less resembling the modern one..." And in a footnote, he adds, " As late as 1651, one ROBERT JAGER published (London, small 8vo.) his 'Artificial Arithmetick in Decimals'... It is by no means impossible that this may have been a real invention, and not an impudent fraud; for the present system was not well established in 1651, and not so well as people would think who judge by the works which have lasted, in 1700."

I should be glad to know of any other references to either the book or its author.

JAGER's *Artificial Arithmetick* is interesting of course in a general way, but it is probably only another of the several books of its kind which appeared during that century. Why they have disappeared so completely might be explained by either of two reasons. Perhaps they were considered of little worth at the time, and consequently had no large circulation. On the other hand, to be more charitable, they may have been so useful to their many owners that they were rapidly worn out! Conjecture aside, whatever the reason for their scarcity now, it seems that some record should be made of the work of ROBERT JAGER, Gent.

A reproduction of the title-page accompanies this note; and we give below the preface, the table of contents, and extracts from a few pages of the text.

To The
READER :

Courteous Reader :

Here is presented to thy view, an exact and compendious form of *Artificiall Arithmetick*, performed all by Tens or *Decimals*, in which, all the intricate and tedious reductions of Fractions, commonly used in Vulgar or Naturall Arithmetick are wholly avoyded, and taken off as of no use; and any Question, of what nature soever, may be hereby resolved by whole Numbers only, whether it be conversant about either Money, Weight, Measure, Time, interest, Annuities, Barter, Exchange, Losse, Gaine, Fellowship, &c.

Therefore taking into consideration the common way of *Naturall Arithmetick*, and finding it to be tedious and prolix, God in his mercie towards me, directed me to this way, which thou wilt finde to be very ready, acute, and exact, working that at one operation, which by the common way you must make four or five works of. And, therefore, I thought good to expose it to publique view, for the better directing thee in the readiest and exactest way of *Arithmetick* that can possibly be invented, which I hope thou wilt approve of, and gain experience by.

Herein the *Merchant* may be fully satisfied of the worth or value of any forreign *Coyn* in *English money*, and upon any *gain* or *losse* in any *commodity*, may exactly compute his *profit* or *disadvantage*, with far more facility (and altogether as much exactnesse) as by any way heretofore practised.

The *Trades-man* or *Artificer* may herein be *copiously* furnished with the *Quintessence* of the *Golden Rule* in all his severall varieties, either *Direct* or *Retrograde*; *Single* or *Double*, with the *conversion* or *alteration* thereof according to the tenor of the *Question* propounded.

The *Cannoneer* or *Gunner*, as also the *Practicall Geometrician* may herein receive abundance of satisfaction, in finding the *Weights* and dimensions of several *Figures* and *Metals*, as of *Squares*, *Spheares*, *Circles Pyramids*, *Parallelograms*, &c.

Should I insist upon all the uses that this *Treatise* is assistant to, I should sooner want *words* then *matter*, the *uses* thereof being as many, as every mans *practise* or *occasion* can require, so that I should soone *exceed* the *bound* of a *Preface*.

And thus, wishing *thee* all *Health* and *Happinesse*, I commit *thee* to *Gods Sacred Protection*, and rest,

Thy reall Friend,
Robert Jager.

THE CONTENTS

1. *Ninteen Rules for direction and iutroduction ineo this Artificiall Arithmetick* 1
2. *Numeration* 48
3. *Addition* 49
4. *Substraction* 57
5. *Multiplication* 65
6. *Division* 71
7. *The Rule of Three Direct* 85
8. *The Backward Rule of Three* 96
9. *The Double Rule of Three* 103
10. *The double Rule of Three wrought backwards* 111
11. *The Rule of Three after a Duplicated proportion* 112
12. *The Backward Rule of Three after a Duplicated proportion* . . 114
13. *The rule of Three after a triplicated proportion* 116
14. *The Rule of Practise by Multiplication only* 118
15. *The rule of Practise by Division only, having* 1 *in the second place* 124
16. *The rule of Practice by Division only, having* 1 *in the third place* 128
17. *The rule of Proportion conteining these five Uses* 132
First, *To finde what any sum of money, to be paid at the end of* 1, 2, 3, 4, 5, *or more years, with use upon use, will increase unto* 133
Secondly, *To finde what any sum of money to be paid at the end of* 1, 2, 3, 4, 5, *or more years, abating use upon use, will decrease unto* 141
Thirdly, *To finde the present worth of* 100 *lib. or any other sum of money, to be paid at the end of* 20 *yeares, or any shorter time* . . . 149
Fourthly, *To find in how many years* 100 *lib. or any other sum will be paid by* 8 *li. or any other sum by the year, allowing use besides* 152
Fifthly, *To finde the true and perfect worth of any Office, Lease, Yearly Pension or Annuity, to continue for any term of years, and the solution of all difficult Questions of that nature* 158
18. *Fellowship in Gain* 170
19. *Fellowship in Losse* 177
20. *Fellowship in Time* 183
21. *Equation of Payments in time* 188
22. *Equation of payments present or without Time* 191
23. *Tare* 207

24. *Gain* 210
25. *Losse* 216
26. *Barter* 219
27. *Alligation* 223
28. *Exchange* 227
29. *Progression* 230
30. *Single Position* 235
31. *Double Position* 240
32. *Of taking Distances at one Station* 249

[pp. 1, 2.] ARTIFICIALL ARITHMETICK

Intending to treat of *Artificiall Arithmetick*, I held it convenient first of all to demonstrate what it is, how it works, and the facility and readinesse thereof, in all manner of Arithmeticall operations, excelling Naturall Arithmetick in this, that it useth not Reduction and equalling the *Logarithmes*, in that it may be carryed in memory, and used without the help of a Table (which they cannot) and agreeing with them in exact working both of Whole Numbers and Fractions.

Artificiall Arithmetick therefore is that, which addeth and substracteth, multiplyeth and divideth, whole Numbers and Fractions together, and the Totals and Remainers, Products and Quotients, give the whole Numbers and Fractions without the help of *Reduction* more perfectly and readily than naturall Arithmetick doth or can; and in this respect onely it differeth from natural Arithmetick.

The Fractions in this kind of Arithmetick, are of several denominations, as Primes, Seconds, Thirds, Fourths, Fifts, Sixts, &c. *ad infinitum*. And 10 of every one of these denominations, make 1 of the precedent numbers. As,

10 Sevenths		Sixt
10 Sixts		Fift
10 Fifts		Fourth
10 Fourths	make 1	Third
10 Thirds		Second
10 Seconds		Prime
10 Primes		Unit, whether the Unit

be 1 Pound, 1 Yard, 1 Ell, 1 Acre, 1 Perch, or Rod, 1 Foot,

1 Inch, 1 Hundred weight, 1 Year, 1 Moneth, 1 Houre 1 Minute, 1 Second, or 1 Ounce, for all these, and such like, are expressed in artificiall Fractions, as the parts of a Pound.

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[p. 6.] 1. *Example.*

..
15
025
00625
0020834
0020834
0010417
.....
1864585

2. *Example.*

..
45
0125
00625
0020834
0020834
.....
4729168

And although sometimes the Fractions be so smal, that there is neither primes nor seconds in them, yet set Cyphers to keep the places of primes and seconds, whereby the rest that follow, may be known, what denomination they are of, and put pricks over their heads to distinguish them from whole Numbers: as in the Fraction expressing 3 pence [$\dot{0}125$], there is no primes, and in the Fraction expressing 1 penny 2 farthings [$\dot{0}0\dot{6}25$], there is neither primes nor seconds, yet Cyphers must be set to keep their places, as both in the precedent Examples, and Tables plainly appeareth.

[pp. 7, 8.] *To set down whole Numbers and Fractions*

If you be to set down Fractions with whole Numbers, ...first put down your whole Numbers each denomination under other, ...then your Fractions, primes under primes, seconds under seconds, &c. And having added them together, draw a prime line, and prick your Fractions to distinguish them from whole numbers [e.g., 24 | $\dot{0}375$].

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Amateurs of Science in 17th Century England (1)

Science-lovers in England, the "virtuosi" as they called themselves, contributed greatly by their enthusiasm and their cooperation to make the seventeenth century "the century of genius" (2) in scientific achievement. Indeed their interest and their activities may help to explain why England from 1600 to 1685 produced four of the six geniuses of first rank that make this century unique in the history of science. GALILEO and KEPLER were the stars on the continent; but GILBERT and HARVEY, BOYLE and NEWTON were England's contribution to scientific genius of the same first class, and pressing hard at their heels came a long line of workers only less notable than these leaders, —such men as CHRISTOPHER WREN, ROBERT HOOKE, SYDENHAM, RAY and WILLUGHBY. The Royal Society which the virtuosi founded and the *Philosophical Transactions* which they created as a scientific journal are enduring evidences today of the cooperative activities of the amateurs of science in the seventeenth century.

Many factors combined to produce the cultural setting which brought to fulfilment in this period some of the genius the psychologists tell us is latent in every generation. The Age of Discovery had accelerated the development in ELIZABETH's time of a wealthy middle class and had fed people's imagination with stimulating new ideas and new knowlegde. The critical spirit summed up in theological and ecclesiastical matters by the term, "the Protestant Revolt," influenced thought in other activities

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(1) A lecture read at Radcliffe College, Cambridge, Massachusetts, U.S.A. on October 26, 1938. Much of this material was gathered while the writer was a fellow on the John Simon Guggenheim Memorial Foundation.

(2) WHITEHEAD, ALFRED N. *Science and the Modern World* (New York, MACMILLAN Co.), chap. III : "The Century of Genius."

as well, notably the political, and also, in my opinion, the scientific. The dominance of ARISTOTLE in the universities for the preceding three centuries and more was in the 17th century increasingly questioned as a result of the experiments of a GALILEO and the many observers following his lead. But England had never submitted completely to ARISTOTLE's dominance,—the influence of men like Bishop ROBERT GROSSETESTE and ROGER BACON had been too strong. Years before 1583 when GIORDANO BRUNO brought his heretical philosophy to England, LEONARD and THOMAS DIGGES had been leaders in making the anti-Aristotelian idea of an infinite universe a natural and logical conclusion from the heliocentric theory of the universe proposed by COPERNICUS in 1543 (3). The critical spirit that challenged the doctrine of the Petrine supremacy for the papacy and the divine right of kings found ample material for criticism also of the ancient philosophers, especially ARISTOTLE, in the increasing number of new tools and new theories resulting from the gathering impetus of 17th century science. All the world has heard of GALILEO's telescope. It is less generally known that the 17th century saw also,—to name only a few—the barometer, the air-pump, the pendulum clock, logarithms, an increased standardization of mathematical symbols, and especially the compound microscope,—a clumsy instrument of course until the invention in the next centuries of the achromatic lens and other refinements. Furthermore, English thinkers, unlike most of those in continental countries, had nothing to fear from the authority of the Inquisition which burned BRUNO at the stake in 1600 and silenced GALILEO in 1633; nor did their books have to receive an ecclesiastical *imprimatur*. MILTON's plea for the freedom of the press fell on ground well prepared to receive it.

England, therefore, in the days of the first STUARTS had increased wealth and opportunity for the middle classes, greater intellectual freedom than the continent as a whole, and a critical spirit already at work in ecclesiastical and political matters that readily carried over into the fascinating pursuits of the new natural philosophy. For the Puritans this new philosophy, experimental science, had special value : it was a revelation of God's power in nature,

(3) JOHNSON, FRANCIS R. and LARKEY, SANFORD V, " THOMAS DIGGES, the Copernican System, and the Idea of the Infinity of the Universe in 1576 " in *The Huntington Library Bulletin*, no. 5, (April, 1934), pp. 69-117.

it led to profitable discoveries and useful knowledge, it was free from the emotional irritations characterizing many of the political and theological disputes of a period that finally moved into civil war, and it gave such refreshment, entertainment and keen intellectual delight that a number of these Puritans became true amateurs of science. Characteristic of this period and contributing to its special greatness as never before in the history of science was the definite recognition given to the value of cooperative activity and the conscious effort made to bring this cooperation to pass (4). The Royal Society of London today stands as the great contribution of these amateurs in the 17th century to " the promoting of experimental learning," and " the improving of natural knowledge."

The English seem to have been a practical people with the thinkers never far from the workers : ROGER BACON preached the importance of practical knowledge, CHAUCER wrote a handbook on the use of the astrolabe, the DIGGES, father and son, worked with the navigators checking theory with experience and practice. Sir FRANCIS BACON, however, set the pattern for cooperative work in England when in his *New Atlantis* published in 1627 after his death, he described his House of Salomon, what we would call today a research institute. In his *Advancement of Learning* he had charted the fields of knowledge, pointing out how much was still to be done, while in his *Novum Organum* he had demonstrated the need to assemble particulars before asserting principles, and laid an emphasis upon inductive thinking that the seventeenth century Baconians took to heart. For an example of this influence, one has only to glance through the BOYLE correspondence from about 1645 to 1691 (5) to see how these amateurs, BOYLE's friends, gloried in serving in the slightest degree to further natural philosophy through any aid they could give BOYLE. Dr. BEALE, a Cambridge graduate, and in 1660 rector

(4) STIMSON, DOROTHY, " Puritanism and the New Philosophy in 17th Century England " in *Bulletin of the Institute of the History of Medicine* (Baltimore, Md.) vol. III, no. 5 (May, 1935), pp. 321-334; MERTON, ROBERT K., " Science, Technology and Society in Seventeenth Century England," *Osiris*, Vol. II, part 2 (1938), pp. 471-474; JONES, RICHARD F., *Ancients and Moderns, A Study of the Background of the ' Battle of the Books,'* Washington University Studies, new series, no. 6 (St. Louis, 1936), pp. 174-187, 283.

(5) *Works of Robert Boyle*, (London, 1772, 6 vols.) vol. VI, pp. 33-672.

of Yeovil, wrote BOYLE November 9, 1663 : " If you give these things in charge amongst your acquaintance, that each man in his way may add to the search of others, then you do fully prosecute the Verulamian design; then our labour is joined and collegiate, and not always running in the narrowness of single endeavors " (6). HENRY OLDENBURG writing to BOYLE June 10th, 1663, quoted a French correspondent in Paris as saying : (I translate) " One must admit that the English surpass them [the French virtuosi] and have the advantage over the other peoples of Europe, for they have given us a quantity of curious facts, in addition to the great books which they have published. On the contrary, the books published in Paris do not deserve to be read, at least most of them, being nothing but reiterations and assertions; without the facts which satisfy the mind " (7).

BACON's House of Salomon with its plan for collecting, assembling, and reporting facts after their verification was the forerunner of a number of such plans proposed during the first fifty years after its publication. Some were for cooperative living as a means toward the furtherance of all knowledge, as COMENIUS and HARTLIB dreamed. Others provided for the quiet undisturbed study of natural philosophy, as EVELYN proposed for six philosophers,—himself, his wife, a third who, he hoped, would be BOYLE, and three others (8). WILLIAM PETTY, stimulated by HARTLIB's interest, printed in 1648 his plan " for the Advancement of Some Particular Parts of Learning " that combined a school, a workman's college, and a hospital, with a repository or museum and a library, to give training to all, especially in mathematics and the practical arts (9),—a central place that would record what had been done, what was being done, and what needed to be done. In a letter to BOYLE, May 9th, 1657, EVELYN referred to " that mathematico-chymico-mechanical school designed by our noble friend Dr. WILKINSON " as " another Solomon's house " (10). In 1661 ABRAHAM COWLEY published his " Pro-

(6) *Ibid.*, vol. VI, p. 353.

(7) *Ibid.*, vol. VI, 145-146.

(8) *Ibid.*, vol. VI, pp. 289-291.

(9) " Advice of W. P. to Mr. SAMUEL HARTLIB for the Advancement of some Particular Parts of Learning." (London, 1648) as reprinted in the *Harleian Miscellany*, vol. VI, pp. 1-14 (London, 1810).

(10) *Works of Robert Boyle*, vol. VI, p. 287.

position for the Advancement of Experimental Philosophy " to carry on the ideas of BACON's *Novum Organum* through the work of twenty professors aided by sixteen young scholars. Four of the professors were always to be travelling, one in each of the continents, for a period of three years at a time to send or bring back accurate reports on all that was done there, for " the Inquisition into the nature of God's creatures and the application of them to human uses (especially the latter) seem to be very slenderly provided for, or rather almost totally neglected except onely some small assistance to Physick and the Mathematicks." " No man can hope to make himself as rich by stealing out of others trunks as he might by opening and digging of new mines " (11).

But these were schemes on paper, however ingeniously devised and carefully discussed financially. Actually, long before the publication of BACON's books, Gresham College as an educational center for the citizens of London had been established in that city by the far-seeing generosity of Queen ELIZABETH's financial agent, Sir THOMAS GRESHAM. In 1597 in what had been his residence, the seven professors on this foundation began the series of lectures in astronomy, geometry, physics, law, divinity, rhetoric and music, that became of great significance in the development of science during the 17th century. The succession of learned men occupying these professorships made an intellectual headquarters of their rooms at Gresham College for the many others of like interests who were in London on various business. Here the virtuosi attending the Gresham lectures lingered on afterwards for discussions with the professors. Five of the seven professors in 1662 were charter members of the Royal Society. Their chambers were its meeting place until the Great Fire of 1666 compelled the city authorities to take the College building over for public business. And to Gresham College the Society returned in 1673 to remain till 1710 (12). In fact so closely was the Royal Society linked with Gresham College in those early years that

(11) COWLEY, ABRAHAM, *A Proposition for the Advancement of Experimental Philosophy*, (London, 1661), Preface.

(12) WARD, JOHN, *Lives of the Professors of Gresham College, to which is prefixed the Life of the Founder, Sir Thomas Gresham, with an appendix consisting of orations, lectures and letters written by the Professors, with other Papers serving to illustrate the Lives*, (London, 1740), preface and pp. 34-35.

the name " Greshamite " was applied familiarly to the fellows of the Society and the Society itself was often spoken of as Gresham College, although the two were distinctly different organizations. Their interrelationships were convenient to both; for example, it was through the College that CHRISTOPHER WREN joined the London virtuosi when a Gresham professorship in astronomy brought him up from Oxford in 1657, and it was at the College that the Society in its early years stored its collections and kept its books.

The spirit of cooperation was a notable characteristic of seventeenth century science in England, and a logical outcome of the demands made by the new philosophy that many particulars, or facts, were required before hypotheses or principles should be laid down. The virtuosi recognized fully that not all of them might be qualified to formulate these theories, but that the assembling of observations and the amassing of any evidence however seemingly irrelevant, remote or unimportant, was well within the powers of all men and might prove to be of much service to the true leaders of scientific thought. Such were the teachings of the Baconian inductive philosophy, and such was the practice of the many science-lovers in this century not only in England but on the continent. In fact, the first cooperative groups seem to have originated in Italy where the Accademia dei Lincei was established in 1601, and the Accademia del Cimento of Florence (1657-1667) drew together the pupils of GALILEO to develop experimental evidence for and elaborate upon the problems he and TORRICELLI had presented (13). In Paris, Père MERSENNE of the Minorites until his death in 1648 was a center and leader of scientific thought not only through his own experimental work but as the friend and correspondent for workers throughout Europe, so that his letters served in a measure as a scientific journal. Other science lovers in France, perhaps not of such notable calibre as Père MERSENNE, were to be found in informal groups or academies elsewhere in Paris and in the provincial cities like Caen in Normandy. Professor HARCOURT BROWN, in his study of these organizations, has pointed out

(13) ORNSTEIN, MARTHA, *Rôle of the Scientific Societies in the Seventeenth Century*, (New York, 1913,) pp. 89-109.

their number, their character and their importance in preparing the way for the organization of the Académie des Sciences by COLBERT in 1666 (14). Similar studies are needed to trace groups of this kind in other lands, in the German-speaking countries for instance, in the Low Countries and in other Italian centers beside Rome and Florence.

That these continental activities were known in England and were of definite influence upon the growth of English thought can be traced along many paths. Some of these paths have been already pursued by present-day scholars, as for exemple the influence of DESCARTES upon English thought in 1630's and 40's (15); other paths have yet to be followed up. In the 17th century English travellers abroad whether as students like HARVEY seeking his medical degree at Padua after his graduation from Cambridge, or like BOYLE on a grand tour, whether as Royalist exiles or as agents and representatives of the government in the stormy days of the mid-century,—in any of these capacities the English made acquaintances that frequently led to much interchange by letter of ideas, of contemporary news about people and about books. In return the continent sent her visitors and sometimes her exiles into England, and some stayed on as residents. During the reign of JAMES I, PIERRE MOULIN came as a visitor from France several times; his sons PETER and LOUIS came and remained in England. When the course of the Thirty Years' War drove into exile the reigning family in the Palatinate, the Prince Elector Palatine came to England to throw in his support on the parliamentary side of the civil war while his brother, Prince RUPERT, threw in his support with the Cavaliers; both brought closer the connections between the German Protestants of the Rhine valley and their English friends. At least one English virtuoso associated with the Prince Elector in London visited him in Heidelburg (16), and others probably went, for both princes were themselves keenly interested in the new

(14) BROWN, HARCOURT, *Scientific Organizations in Seventeenth Century France* (Baltimore, 1934).

(15) NICOLSON, MARJORIE, "The Early Stage of Cartesianism in England" in *Studies in Philology*, vol. xxvi, no. 3 (July, 1929), pp. 356-374; JONES, *op. cit.*, p. 136.

(16) POPE, WALTER, *Life of the Rt. Rev. Father in God Seth, Lord Bishop of Salisbury... with Brief Account of Bishop Wilkins...* (London, 1697), p. 27.

philosophy and made the virtuosi welcome. Three other German-speaking foreigners resident in England, SAMUEL HARTLIB, THEODORE HAAK and HENRY OLDENBURG, by their knowledge of languages and their connections in Europe greatly facilitated communications between science-lovers on the two sides of the Channel, for they were among the leading news-distributors-intelligencers of their time.

We know something of the work of these men as translators and as literary agents; but the whole field of the translator as a channel of international relationship awaits detailed study. Who, for example, was the THOMAS SALUSBURY who in 1661 printed his English translations of the pro-Copernicans, GALILEO, KEPLER, FOSCARINI and others in his *Mathematical Collections and Translations* "intended for gentlemen"? Who beside the MOULIN brothers made the French translations and who the Italian ones of the English books which OLDENBURG was having put into Latin? There is room here for a study in interrelations by some one with skill in languages and some knowledge of the seventeenth century.

Further evidence of the international characteristics of scientific work in seventeenth century England and of its cooperative character can be found in the story of the origins and early days of the Royal Society. That Society is today the premier scientific organization in the English-speaking world with election to its membership the crowning recognition for a scientist. Nowadays not more than twenty scientists can be admitted as fellows in any one year, and election of foreigners as fellows is rare (17). Full membership is not recognized until the fellow-elect has signed the famous charter-book of the Society dating back to 1660. In July, 1938, a newspaper recorded that this precious book had been taken from the Society's rooms in Burlington House to FREUD at his retreat in London so that the sick old man could sign the book and thus at last become a full member, though he had been elected in 1936 (18). Gifts and endowments enable the Society to sponsor scientific explorations, encourage experimental research, recognize achievement by medals and prizes,

(17) Royal Society of London; *Notes and Records*. No. 1 (April, 1938), p. 47.
(18) *New York Times*, July 5, 1938, p. 7., col. 4.

advise the state on scientific matters and provide an audience and a testing-ground for new discoveries and theories. It alone is the Royal Society; all others are royal societies of something or other, of geography, or history, or chemistry. Only the Accademia dei Lincei of Rome claims greater age, and the Académie des Sciences of Paris is four years younger. The French *Journal des Savants*, however, antedates the English *Philosophical Transactions* by three months as the oldest scientific journal today.

In the seventeenth century this Royal Society was in no sense a professional organization in its origins but rather a gentleman's club for the discussion of scientific matters with the whole world for its field of activity. The roots of this club run far back to the informal discussion groups of the 30's and 40's, for one of its charter members, Dr. JOHN WALLIS, wrote in 1678 :

" I take its [the Royal Society's] first Ground and Foundation to have been in London about the year 1645 (if not sooner) when the same Dr. WILKINS (then Chaplain to the Prince Elector Palatine, in London), Dr. JONATHAN GODDARD, Dr. ENT (now Sir GEORGE ENT), Dr. GLISSON, Dr. SCARBROUGH (now Sir CHARLES SCARBROUGH), Dr. MERRIT, with myself and some others, met weekly (sometimes at Dr. GODDARD's Lodgings, sometimes at the Mitre in Wood-street hard by) at a certain day and hour, under a certain Penalty, and a weekly Contribution for the Charge of Experiments, with certain Rules agreed upon amongst us. Where (to avoid diversion to other discourses, and for some other reasons) we barred all Discourses of Divinity, of State-Affairs, and of News (other than what concern'd our business of Philosophy) confining our selves to Philosophical Inquiries, and such as related there-unto; as Physick, Anatomy, Geometry, Astronomy, Navigation, Staticks, Mechanicks, and Natural Experiments. We there discoursed the Circulation of the Blood, the Valves in the Veins, the Copernican Hypothesis, the Nature of Comets and new Stars, the Inequalities and Selenography of the Moon, the several Phases of Venus and Mercury, the Improvement of Telescopes, and Grinding of Glasses for what purpose (wherein Dr. GODDARD was particularly ingaged, and did maintain an Operator in his house for that purpose), the weight of the Air, the Possibility or Impossibility of Vacuities, and Nature's abhorrence thereof, the Torricellian Experiment in Quicksilver, the Descent of Heavy Bodies, and the Degrees of Acceleration therein, with others of like nature. Some of which were but new Discoveries, and others not so generally known and embraced as now they are.

" These meetings we removed, soon after, to the Bull-head in Cheapside and (in Term-time) to Gresham Colledge, where we met weekly at Mr. FOSTER's Lecture (the Astronomy-Professor there) and after the Lecture ended, repaired sometimes to Mr. FOSTER's Lodgings, sometimes to some other place not far distant, where we continued such Inquiries; and our Numbers encreased.

" About the years 1648, 1649, some of our Company were removed to Oxford; (first, Dr. WILKINS, then I, soon after Dr. GODDARD); whereupon our Company divided. Those at London (and we, when we had occasion to be there) met as before. Those of us at Oxford with Dr. WARD, (now Bishop of Salisbury),

Dr. PETTY, (now Sir WILLIAM PETTY), Dr. BATHURST, Dr. WILLIS and many others of the most inquisitive Persons in Oxford, met weekly (for some years) at Dr. PETTY's Lodgings on the like account; (to wit, so long as Dr. PETTY continued in Oxford, and for some while after) because of the conveniences we had there, (being the House of an Apothecary) to view and make use, of Drugs, and other like matters, as there was occasion.

" Our Meetings there, were very numerous, and very considerable. For, beside the diligence of Persons, studiously Inquisitive, the Novelty of the Design made many to resort thither; who when it ceased to be new, began to grow more remiss, or did pursue such Inquiries at Home.

" We did afterwards (Dr. PETTY being gone for Ireland, and our numbers growing less) remove thence. And (some years before His Majesty's Return) did meet, (as Dr. HOLDER observes) at Dr. WILKINS' lodgings in Wadham-Colledge.

" But, before the time he mentions [1659] those set Meetings ceased in Oxford, and were held in London. Where (after the death of Mr. FOSTER) we continued to meet at Gresham-Colledge (as before), at Mr. ROOKE's Lecture, (who succeeded Mr. FOSTER) and from thence repaired to some convenient place, in or near that Colledge : And so onward; till the Fire of London, caused our removal to Arundel-house; from whence we are since returned to Gresham-Colledge again.

" In the meanwhile; our Company at Gresham-Colledge, being much again increased, by the accession of divers Eminent and Noble Persons upon His Majesties Return; we were (about the beginning of the Year 1662) by His Majesties Grace and Favour, Incorporated by the name of the Royal Society, etc." (19)

To call attention to certain matters in this account,—Dr. WALLIS states that the discussions were by agreement limited to philosophical inquiries, and that they barred all " discourses of divinity, of state affairs and of news." 1645 in English history stands for the Civil War and the battle of Naseby (news indeed), for the struggles of CHARLES I with Parliament and the army, and the controversies between the Presbyterians and the Independents, a time when RICHARD BAXTER found even the common soldiers around the campfires discussing the weighty problems of infant baptism and of anti-prelacy (20). In such stirring days these friends must have been glad to have at least a few hours in the week when they could come together for unprejudiced consideration of such objective matters as Jupiter's satellites, barometric pressure, and valves in the veins. HARVEY's book on the circulation of the blood had been published in 1628. Though GALILEO's second condemnation by the Church had occurred in 1633, his great work on the physics of motion was

(19) WALLIS, JOHN, *A Defence of the Royal Society* (London, 1678), pp. 7-8.

(20) *Reliquae Baxterianae : or Mr. Richard Baxter's Narrative of the most memorable Passages of his Life and Times.* (London, 1696), p. 53.

published in 1638 while he was a prisoner of the Inquisition. His improvements of the telescope and the discoveries he had made with it had been startling news from 1609 on, for the Aristotelian perfection of the heavens had left no room for the sunspots he had observed, for the mountains of the moon or for the tripartite appearance of Saturn, not to mention the phases of Venus and Mercury,—all giving observational support to the heliocentric theory of the universe which ARISTOTLE had denied. In 1645 these discoveries were still thrilling novelties. In the next few years the virtuosi were to be even more enthralled by the wonders of the infinitely small which the first crude compound microscopes revealed to them.

Who were these men whom Dr. WALLIS names as meeting weekly in 1645, that year of civil war and ecclesiastical dispute? Two or three points about the ten whose names we know concern us here (21). The first is the relative youth of most of the ten, —they were not greybeards spending their days at a club but active men of affairs following up a hobby that fascinated them. Only four of the ten in 1645 were forty or older; Dr. GLISSON was the oldest at 48, while HAAK was 40, ENT 41 and FOSTER, Gresham professor since 1641, was 45. Of the others, BOYLE was the youngest, only eighteen, GODDARD was 28, WALLIS and SCARBROUGH were each 29, and WILKINS and MERRIT each 31. In addition to their comparative youth, a second notable factor was their common educational and political background. BOYLE was the only one not a university man; he had followed Eton with several years of European travel with tutors. That six had been at Oxford, three of them at Cambridge also, and that the other three were Cambridge trained, is not notable in itself; but an interesting fact is their overlapping residence in two of the colleges. GODDARD and WILKINS overlapped each other as students at Magdalen Hall, MERRIT and HAAK at Gloucester Hall, the two strongholds of the Puritans at Oxford. The others did not overlap each other, but they had attended colleges in common. GLISSON and SCARBROUGH, two of the five physicians in the group, were both Caius College men, HARVEY's College at Cambridge, while FOSTER and WALLIS were both from Emmanuel. ENT was from

(21) For further discussion, see references under note (4) *supra*.

Sidney Sussex (which CROMWELL had attended while at Cambridge) and his medical degrees were first from Padua and later from Oxford.

On political and theological matters, so far as I can find out, Dr. SCARBROUGH was in 1645 the only pronounced Royalist. The evidence is not conclusive about two of the others, but MERRIT had a Puritan training, and GLISSON came to London to live later on when Colchester, his home, fell into the hands of the parliamentary forces. The other seven were all Puritan in training and parliamentary in their affiliation, BOYLE through Eton, the others through the strong Puritan groups at Oxford and at Cambridge. There seems to be an interesting connection here between the critical spirit in politics and theology and at least open-mindedness in natural philosophy.

About 1649 three of the "invisible college," to use BOYLE's name for this weekly club, moved to Oxford on various appointments by the parliamentary commissioner. There one of them, Dr. JOHN WILKINS as Warden of Wadham College, attracted to his College a notable group of science-lovers who carried on scientific discussions in Oxford while those left behind in London were also continuing to meet as occasion permitted. Finally with the Restoration in 1660 when many of the Oxford virtuosi had returned to London once more, they decided on November 28th to resume regular meetings, this time if possible as an officially recognized society with royal patronage and a charter. As evidence of their intention WILKINS, if my guess at his handwriting is correct, drew up a brief statement of their agreement :

"Wee whose names are underwritten, doe consent and agree that wee will meet together weekly (if not hindered by necessary occasions,) to consult and debate concerning the promotion of experimental learning. And that each of us will allowe one shilling weekely, towards the defraying of occasionall charges. Provided that if any one or more of us shall thinke fitt at any time to withdrawe he or they shall, after notice thereof given to the Company at a meeting, be freed from this obligation for the future" (22).

By 1663 one hundred and nineteen members had signed this obligation, the origin of the famous charter-book which every

(22) *Record of the Royal Society of London*, 3rd edition, (London, 1912), p. 10. See facsimile reproduction in *Signatures in the First Journal Book and Charter Book of the Royal Society*, (Oxford, 1912).

member of the Royal Society has had to sign from that day to this. During the two years of organization several members served as president for brief periods, but with the granting of the second charter in 1663 Viscount BROUNCKER was made President and continued in office for fourteen years until 1677. A Council of 21 was elected and Dr. WILKINS and the indefatigable HENRY OLDENBURG were made the two secretaries. Of many of the original fellows or members little or nothing is known. As SPRAT, the Society's first historian, characterized them in 1667, they were mostly " gentlemen, free and unconfin'd," who " by the freedom of their education, the plenty of their estates and the usual generosity of noble bloud, may be well suppos'd to be most averse from sordid considerations " (23). By 1667 the Society had grown to number about two hundred with lords of the state and of the church, earls, bishops and archbishops even, who following the fashion set by CHARLES II signed the charter-book in acceptance of membership, along with PEPYS and EVELYN, Sir WILLIAM PETTY, and CHRISTOPHER WREN, ISAAC BARROW, EDMUND WALLER, JOHN WINTHROP of Connecticut, CHRISTIAN HUYGENS and SAMUEL SORBIÈRE,—to name only a few.

At the weekly meetings various members reported to the Society the results of their experiments and observations and tried, frequently with ill success, to repeat these experiments before the group. In a stately unhurried manner that won the approving comment of a foreign visitor (24), the members discussed the reports, asked questions and suggested further problems to be reported on at a later meeting. They drew up questions to be sent by travellers abroad to learn the nature of foreign lands; they planned the writing of histories of trades, of cloth-dyeing, of leather tanning and glass-making. They tried out BOYLE's air-pump and appointed a committee to determine why a sensitive plant folded up its leaves. With the coming of ROBERT HOOKE as the Society's curator in 1663 the experiments at the meetings seemed to proceed more successfully. They began a collection

(23) SPRAT, THOMAS, *The History of the Royal Society of London*, 2nd edition corrected, (London, 1702), pp. 67, 68.

(24) [SORBIÈRE, SAMUEL] *Rélation d'un Voyage en Angleterre où sont touchées plusiers choses, qui regardent l'estat des Sciences, et de la Religion, et d'autres matières curieuses.* (Paris, 1664), p. 90.

of curiosities in their repository or museum for which NATHANIEL GREW was later to be curator, and they welcomed the books their members wrote with their approbation and encouragement, as WILKINS' *Essay on the Philosophical Character*, and HOOKE's master-piece *Micrographia*. They kept faithful record of their meetings (25) and some took pains to write to absent members an account of the proceedings, as OLDENBURG did to BOYLE, until OLDENBURG served them all by printing an account monthly, the *Philosophical Transactions*.

Naive as the experiments seem to us today, I wish I could reproduce for you the spirit of eager enthusiasm and of delight that shines through these reports and the comments on them. Their motto was " Nullius in verba "; they were jokingly told that they should celebrate their anniversary not on St. Andrew's Day but on St. Thomas's for they would not believe unless they had touched (26). So they put the spider inside the ring of ground powder from a unicorn's horn (but they do not record where they got the powder) and they watched the spider run out of the ring three times regardless of the powder and of the superstition that said it wouldn't (27). They tried the air-pump in all sorts of ways and were amazed to find that when the air had been pumped out they could not hear a loudly ticking watch inside it. They tried tools and instruments from " a newfangled watch with a slender spring instead of a pendulum " to barometers tested on hilltops and in mines. And they all seem to have felt about these various experiments much as BEALE felt when in his notes for BOYLE on some barometrical observations, he wrote :

" To me it seems the most wonderful discovery that ever was in the world; I dare not except magnetisms, if we speak of strangeness, and just wonder, and philosophical importance, separated from the interest of lucre. For who could ever expect that we men should find an art to weigh all the air that hangs over our heads, in all changes of it, and as it were to weigh and distinguish by weight the winds and the clouds? Or who could believe, that by palpable evidence we should be able to prove the serenest are to be most heavy; that thick air, and when darkest clouds hang nearest us, ready to dissolve, or dropping, then to

(25) BIRCH, THOMAS, *History of the Royal Society of London*, 4 vols. (London, 1756-1757), vol. I, *passim*.

(26) AUBREY, JOHN, *Brief Lives, Chiefly of Contemporaries set down between 1669 and 1696*, (edited by ANDREW CLARK, 2vols., Oxford, 1898), vol. II, p. 144.

(27) BIRCH, THOMAS, *op. cit.*, vol. I, p. 35.

be the lightest. To send a servant any hour of day or night, to bring information what the weight of the air, winds or clouds. And surely this belongs to hydrostatics : and although we cannot yet reach to all the uses and applications of it, yet we should be entertained by the inventor for a while upon the delight and wonder. " (28)

So as we read the instructions and the questions to be taken with him for study by a traveller to Iceland, we should not smile too much over the bladder of English air to be carried thither and the one of " Island air " to be brought back (29). Unless they tried, how else could they know?

A fundamental difference between the Royal Society of London and the Académie des Sciences in France and the other continental societies which followed the French rather than the English pattern, was that despite the King's patronage the Royal Society had no subvention from the state for its work. The Society subsisted solely on its dues of a shilling a week and on such gifts and legacies as might be bestowed upon it by its friends. (Today, of course, I should add, it receives a small annual state subsidy for its work.) The French Académie was, on the other hand, practically an arm of the government with its members appointed and paid by COLBERT, its work subsidized by the state and its publications, at least at first, printed as the work of the Académie rather than as the work of individual members. The STUART kings were notoriously short of funds and CHARLES II was no exception. For a time there was talk of the grant to the Society of some of the confiscated estates in Ireland as an endowment, and then in 1669 came a royal gift of the Chelsea College lands, but CHARLES had other uses for them and bought them back three years later. So the Society for its first twenty years limped along with a heavy debt from unpaid dues and a falling away of attendance, perhaps in part because of the ridicule poured out on it for its little understood activities. When WILKINS died in 1672 he left four hundred pounds to the Royal Society, its first important legacy, and incidentally for two years or so a serious problem of investment also. The Society had to purchase

(28) *Works of Boyle*, vol. IV, p. 214.

(29) DERHAM, WILLIAM (publ.), *Philosophical Experiments and Observations of... Robert Hooke... and other Eminent Virtuosos in his Time*, (London, 1726), pp. 19-21.

a chest with a lock to hold the money, for the Mercers and the other Companies for some reason refused to accept the money at interest, and time was needed to decide on and complete the purchase of three fee farms in Sussex with the legacy (30). The income from one of these farms still appeared in the Treasurer's report for 1930.

Sir ISAAC NEWTON's long presidency (1703-1727) and his renown gave renewed importance to the Society; but not till 1847, less than a hundred years ago, were the statutes revised and the membership put on the strictly professional and scientific basis which is its distinction today (31). The amateurs of the seventeenth century builded better than they knew that November day in 1660 when they agreed to organize the Royal Society of London for the Promoting and Improving of Natural Knowledge.

Goucher College DOROTHY STIMSON.
Baltimore, Maryland.

(30) BIRCH, *op. cit.*, vol. III, pp. 93, 120, 123, 129, 138, 139, 141, 144, 155, 175-177.

(31) See *supra*, note (17).

Eine astronomische Handschrift aus dem 17. Jahrhundert

(Mitteilung N° 43 aus dem „Nederlandsch Historisch Natuurwetenschappelijk Museum" zu Leiden.)

Vor kurzem hat Fräulein L. J. RUYS, wissenschaftliche Assistentin am Leidener Gemeindearchive, aus dem Bestande dieses Archivs eine astronomische Handschrift zu Tage gefördert, deren Herkunft unbekannt ist, weil sie nicht katalogisiert war. Diese Handschrift besteht aus einem Paket teils broschierter, teils unbroschierter Papiere in Oktavformat. Es kommen darin vor mathematische Berechnungen, astronomische Beobachtungsdaten und Berechnungen, eine Anzahl Horoskope aus den Jahren 1622 und folgenden, einige Zeichnungen von Instrumenten, ein Grundriss (vielleicht eines kleinen Observatoriums). Der hie und da zwischen den Berechnungen eingestreute Text ist vorwiegend lateinisch, bisweilen findet man einige deutsche, französische oder holländische Wörter; ein Abschnitt über Logarithmen trägt die Ueberschrift : Σὺν Θεῷ d. $\frac{\text{29. Sept. A.C.}}{\text{9. Oktob. A.C.}}$ 1636 Lugduni Batavorum. Auf einem einzelnen Blatte stehen die Daten einer Beobachtung der Mondfinsternis auf der Insel „Anton Vaaz Brasiliae" am $\frac{10}{20}$ Dez. 1638 und auf der Rückseite die hieraus abgeleitete Berechnung der Längendifferenz zwischen Anton Vaaz und Uranienborg, der Sternwarte des TYCHO BRAHE. Die Jahreszahlen, die neben den Berechnungen stehen, variieren von 1600 bis 1638; dies heisst aber noch nicht, dass die Rechnungen auch in diesen Jahren ausgeführt worden sind, sie könnten sich ja auch auf Daten aus diesen Jahren beziehen. Ungefähr am Ende der Beobachtungsdaten (die letzten sind datiert 6. Nov. 1637) finden wir die folgenden Worte : Haec ultima mia observatio

Leidensis est, nam seqq. dieb. turbidum fuit, et ego die $\frac{18}{8}$ Novembr. illic discissi in Americam Australem abiens.

Eine Signatur ist nirgends zu sehen.

Schliesslich erwähnen wir noch eine Skizze zu einem Inhaltsverzeichnisse einer „Historia naturalis Brasiliae." Soweit die Handschrift.

Es ist uns nun gelungen zu zeigen, dass diese Handschrift ohne Zweifel herrührt von Dr. GEORG MARCGRAF (oder MARKGRAF) geboren zu Liebstadt in Sachsen am 20. Sept. 1610 (er unterzeichnete : G. MARCGRAVIUS DE LIEBSTAD, GERMANICUS MISNENSIS), Mediziner und Naturhistoriker, aber auch Mathematiker und Astronom.

Es wird von ihm erwähnt, dass er weite Reisen durch Europa gemacht, auch zu wissenschaftlichen Zwecken Brasilien vom Rio Grande bis südlich von Pernambuco bereist habe und dass er 1644 auf einer weiteren Reise an der Küste von Guinea gestorben sei. Es dürfte weniger bekannt sein, dass MARCGRAF zu dem wissenschaftlichen Stab des Grafen JOHAN MAURITS VAN NASSAU gehört hat. JOHAN MAURITS, GRAAF VAN NASSAU-SIEGEN, geboren 1604, gestorben 1679, war ein Enkel des älteren Bruders des WILLEM I VAN ORANJE, des ersten „Stadhouder" der Niederlande. Im Jahre 1636 wurde er zum „Gouverneur Generaal" den holländischen Kolonien in Brasilien ernannt; im selben Jahre zog er dorthin, verwaltete die Kolonie bis 1644, in welchem Jahre er nach Holland zurückkehrte. Der kleine schöne Palast, den JOHAN MAURITS sich nach den Entwürfen des JACOB VAN CAMPEN von PIETER POST hatte bauen lassen, war in diesem Jahre fast fertig gestellt; er wird noch immer „Mauritshuis" genannt und beherbergt seit mehr als hundert Jahren die berühmte staatliche Gemäldegalerie.

Gute Auskunft über diese Periode im Leben des JOHAN MAURITS findet man in einem Büchlein von P. M. NETSCHER : „Les Hollandais au Brésil," das 1853 im Haag erschienen ist und in dem man findet (1), dass JOHAN MAURITS auf seiner Reise nach Brasilien im Jahre 1636 unter andern begleitet war von dem „naturaliste PISO de Leyde" und weiter (2), dass er auch „un

(1) S. 85.
(2) S. 105.

naturaliste allemand, [MARCGRAF" engagierte und schliesslich : „Ces deux savants (1) firent des observations d'histoire naturelle de la plus haute importance. On éleva sous leur direction un observatoire dans l'île d'ANTONIO VAZ, aux frais du Comte MAURICE." Dies stimmt, wie man sieht, ausgezeichnet mit der Längenbestimmung dieser Insel, die sich in der Handschrift vorfindet (2). Dass MARCGRAF tatsächlich in Leiden studiert und gearbeitet hat, ergibt sich daraus, dass sein Name im Album Studiosorum der Leidener Universität vorkommt. Dato 11. Sept. 1636 findet man dort : GEORGIUS MARCKGRAEF Lipstadio-Misnicus 27 M. Wir glauben also, dass es keinem Zweifel unterliegt, dass die Handschrift im Leidener Gemeindearchive von MARCGRAF herrührt.

Gerne spreche ich meinen herzlichen Dank aus an Fräulein H. A. KLUYVER, astr. Docta., Leiden, für ihre vielen wertvollen Ratschläge im Laufe dieser Untersuchung.

Leiden C. A. CROMMELIN.

(1) PISO und MARCGRAF.

(2) A. G. PINGRÉ, Annales sélectes du XVII siècle (ouvrage publié sous les auspices de l'Académie des Sciences par M. G. BIGOURDAN, Paris, 1901) erwähnt auf S. 125 und 126 einige Beobachtungsdaten von MARCGRAF, „dans la nouvelle ville de MAURICE, île d'ANTOINE WAAS au Brésil" in Bezug auf dieselbe Mondfinsternis, aber nicht dieselben Daten der Handschrift, und weiter, dass die Sternwarte des MARCGRAF erst im September 1639 fertig war.

Scientific notes from the early minutes of the Peterborough Society 1730-1745

In 1710 was founded the Spalding Gentlemen's Society with the true spirit of learning permeating all its endeavours. Its first minute book voices the dictum :

" If thou hast gathered nothing in thy youth, how canst thou find any thing in thine age ? "

The beams of enthusiasm shed by the Spalding Society saw reflection twenty years later in the formation of a sister society in the neighbouring town of Peterborough, namely, the Gentlemen's Society in Peterborough " Instituted this Twenty sixth day of August 1730, for the improvement of Literature and promoting of Friendship and good neighbourhood " The active president at Spalding, MAURICE JOHNSON, became an " Honourary Member " at Peterborough, and communicated notes of interest from Spalding to Peterborough.

Often only half a dozen members congregated at each meeting, but there was a much greater total membership, and at Spalding, we have the names of JOSEPH BANKS of Revesby, Sir ISAAC NEWTON, and JOHN LANDEN of Peterborough in the list of Honorary Members, whereas at Peterborough, there was considerable support from the nobility. The Earl FITZWILLIAM of Milton, near Peterborough (for whom JOHN LANDEN worked as estate agent) (1) took the chair at Peterborough on March 30th 1785, and again at later dates. On one occasion the Earl and the Hon. EDWARD WORTLEY entertained the members at the Angel Hotel.

The proceedings of both societies contain notes of interest

(1) Curiously enough, the name of the reclusive JOHN LANDEN does not appear at all in the records of the Peterborough Society though the Society subscribed to his " Residual Analysis " of 1764. It is probable that LANDEN did not wish to attend regularly, for the Rules of the Society laid down that " No Gentleman living within 5 miles off Peterborough shall be admitted otherwise than a Regular Member."

on a multitude of topics, and it is proposed to set down here a few extracts of scientific interest from the earlier minutes of the Peterborough Society.

At the first meeting of all there is a record of an interesting hydrostatic experiment :

Aug. 26. 1730

An Extract of a letter communicated to the Society by Mr. Jn° Powell Junr.

Experiment of an empty bottle well cork'd let down into the Sea 55 fathoms.

Being on the coast of Norway, where the water is deep on a fine, calm, sunshiny day & the sea very smooth, I took an empty glass bottle and cork'd it well, driving the cork with a piece of wood as far in as I cou'd after w^ch the bottle was made fast to a fishing line something thicker than whipcord, with a lead at the end to make it sink, then I let the bottle down into the water till it struck ground w^th the lead, and took care not to let it go down too fast, least it shou'd be broke against the lead when it came to the bottom : for the bottle was made fast but a little way from the lead : then I pull'd it up as gently as I cou'd & found the cork press'd quite into the bottle : w^ch was fill'd with water as clear as christal, and as salt as water cou'd be. After that tryal was over, I cork'd a second bottle and try'd another time after the same manner, but the cork I us'd in the latter happening to have a screw hole in it, the water had insinuated itself thro' it and fill'd the bottle two thirds full, & the cork was press'd half an inch into the neck of the bottle, and there stuck so fast that I cou'd not thrust it into the bottle w^th my thumb nor cou'd scarce pull it out w^th a screw; at the putting of w^ch thro' the cork, the air came rushing out w^th an hissing noise and might be felt like a wind against one's hand and y^e water upon drawing the cork fell into a ferment like bottl'd ale. After the tryal with the second bottle I measured the line from the lead to that part w^ch was at the surface of the water when the lead was at the ground and found it to be 55 fathoms or 330 foot and at a smaller depth it will not succeed, w^ch shews that 'tis owing to the pressure of the water on the cork, by the weight of w^ch 'tis press'd into the bottle; for supposing the Diameter of the cork to be one Inch there was a cylinder of water as A B C D of an inch diameter and 330 foot high pressing upon the cork. Now the area of a Circle whose Diameter is one inch is $\frac{7854}{10,000}$ of an Inch; therefore .7854 multiply'd by 3960 Inches, the height of the Cylinder, the Product will be 3110,184 w^ch is the number of Cubick Inches contain'd in the Cylinder of water that press'd upon the cork. Now according to Ward's Tables of Specific Gravity, a Cubick Inch of Sea Water weights .594894 of an ounce avoirdupous, w^ch multiply'd by 3110.184 the number of Cubick Inches in the Cylinder gives 1850 ounces & .2298 parts of an ounce. Now 1850 divided by 224, the ounces in a Stone weight, give 8 stone 58 ounces, the weight of the whole Cylinder of water that press'd upon the cork; w^ch, I think, is a sufficient weight to thrust in any cork whatever.

Fig. 1.

I am, Yrs

&c

Lynn, July 27 1730 "

WM. Elstobb Junr.

Mr. ELSTOBB's activities will be mentioned further in this survey. Then follows some confusion between pressure and total thrust :

Obs[a] on the fore-going Experim[t].

Obs. The pressure of all Fluids being according to their perpendicular height only, w[th] out any regard had to the superficies of the compress'd body, it may be question'd whether there was that weight of water pressing upon the coxk w[ch] the Gent. makes it; for if the cork had but been half an Inch diameter there wou'd have been the same weight of water upon it, tho', according to his calculation, there wou'd but be just half the weight, tho' that indeed or even a less weight than that might be sufficient to have thrust in the cork.

Qu. Quaere whether the water that oozed thro' the Screw hole in the 2[d] Exper[t] was as salt as the first or no?

Mathematical problems were sometimes put forward for discussion. Unfortunately the solutions are not often given. The following is an exception.

Sep[t]. 23. 1730

Mathematics

There's a Clock has 2 hands upon the same centre, one moves 5 times round in 4 hours, the other 6 times round in 5 hours. Quie, the Synodical period of those 2 hands. By Mr. MARSHALL.

x the Synodical period.

$$\frac{6x}{5} + \frac{1}{1} = \frac{5x}{4}$$

$$\frac{6x + 5}{5} = \frac{5x}{4}$$

$$24x + 20 = 25x$$

$x = 20$ hours the Syn. Period

	hours	rounds	hours	rounds
If	4 :	5 ::	x :	$\frac{5x}{4}$
	5 :	6 ::	x :	$\frac{6x}{5}$

	hours	rounds	hours	rounds
If	4:	5::	20:	25
If	5:	6::	20:	24
			add	1
				25

Q. E. Jn.

Here is a philosophical problem :

Sep[t] 30 1730

Philosophy

CHEYNE (in his principles of Natural Religion) is of opinion that animals of different sizes view objects differently; and that as their sizes are greater or less, so the same objects at the same distance appear less or greater, in a magnitude reciprocally proportionable to their own bulks.

Then follow Mr. LYNN's observations on the weather for 5 years. These appear for April 28. 1731 and shew barometric readings to

the nearest $\frac{1''}{100}$, rainfall, maximum and minimum temperatures, and " the quantity of winds that blew and from what quarter in the years 1726, 1727, 1728, 1729 and 1730."

The present of books to the Society is often mentioned; here are two instances.

June 23. 1731

" Presented to this Society by Jn° Rowel Esq^r Presid^t thereof S^r Isaac Newton's Chronology in 4^to fairly gilt and lettered."

Sept. 22 1731

" Dr. Balguy's present of Grew's anat. of Plants Fol. w^th cuts curiously engrav'd."

The use of weights is next emphasized :

Jan. 26. 1732

Hydrostatical Experiment

" Communicated and shewn to this Society by Dr. Balguy, a member, an hydrostatical experiment whereby it appears that a Pint of Peterborough spring water is 16 grains heavier than the same quantity of water out of the River Nene.

Then is recorded the admission of William Elstobb junior, of Lynn. This personality seems to have had a keen mathematical insight and a flair for observation. He was a versatile scientist and made several communications to the Society. Unfortunately, apart from such communications (which are here given) and the footnote below (2) little is known of him.

April 11 1733

Mr. Elstob admitted. Mr. Wm. Elstob Junr. admitted an honorary member of this Society.

His Observations on ye Lunar Ecclipse Nov. 20th 1722

Communicates at y^e same time his Observations of ye Lunar Ecclipse Nov^r. 20. 1732 by a watch set to apparent Time at Lynn.

at 7H = 8′ = 00″ The Eastern Edge of y^e Moon, a little below y^e spot call'd Grimaldus, began to change Colour and grow dim, w^ch I took for ye entrance of ye fainter part of y^e Penumbra.

8 = 6 = 10 The Umbra or dense Shadow, came on to ye Eastern Limb a little below Grimaldus, tho' I found it very hard to determine y^e Limits where y^e Penumbra ended and y^e Umbra began.

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(2) William Elstobb practised as an engineer. It is likely that he produced maps of the Lynn-Spalding district. In the library of the Spalding Gentlemen's Society is a work entitled " Historical account of the great level of the fens called Bedford Level and other fens, marshes, and lowlands." By the late W. Elstobb, Engineer. Lynn, 1793, pp. 276.

7 = 00 Grimaldus touch'd ye edge of ye Umbra.

7 = 45 The Umbra came on to y^e^ Eastern Part of Ocean^a^ Procollarum

11 = 45 The Umbra came on to y^e^ Eastern confines of Mare Humorum.

22 = 00 The Umbra touch'd ye East part of Copernicus.

24 = 00 Copernicus totally immerg'd.

28 = 30 The Umbra enter'd ye South part of Sinus Iridis.

46 = 00 The Umbra enter'd ye East side of Terra Mannae.

57 = 00 The Umbra ye east side of Mare Crisium.

59 = 00 The Umbra touch'd ye west side of Mare Crisium.

9 = 4 = 00 Total Darkness began i.e. the Umbra spread it selve all over y^e^ Moon.

10 = 44 = 30 Total Darkness ended, and ye eastern edge of y^e^ moon began to be entirely clear of y^e^ Penumbra.

46 = 30 Grimaldus totally emerg'd.

11 = 3 = 30 Copernicus emerg'd.

6 = 15 Tycho emerg'd.

9 = 00 A dark spott in terra prumes on y^e^ Nrth coast of Mare imbrium emerg'd.

25 = 45 Possidorus in ye West coast of Mare Lerinitatis.

37 = 00 Beda in ye West coast of Mare Lerinitatis.

42 = 00 The western edge of ye Moon became wholy visible w^ch^ I reckon ye end of ye Eclipse so y^t^ from y^e^ time of ye Entrance of ye Penumbra to y^e^ time of its leaving ye moon was 3 h. 47 m. and from ye coming on of ye Umbra to its leaving y^e^ moon was 2 h. = 33^1^ = 50″ and ye time of ye total darkness 1 h. = 40^1^ = 30″.

And thus you have my observations on ye Eclipse with as much exactness as I c'd make them with a six foot Telescope—I almost forgot to take notice y^t^ ye shade enter'd y^e^ moon a little below Grimaldus and went off at y^e^ upper part of Mare Faecunditatis, a little below Mare Crisium and y^t^ during ye time of y^e^ Total darkness ye moon appear'd of a dusky red Colour, being more intensely dark towards ye central parts and with a sort of red Lustre towards ye Western edge, till after ye middle of total darkness, then y^e^ Western limb became obscure, and y^e^ like lustre appear'd on ye Eastern Limb, ye brightness of w^ch^ increas'd till ye total darkness ended.

This is a Phenomenon y^t^ happens contrary to most People's Expectation, who generally suppose yt as y^e^ moon is it self a dark body and y^e^ light of y^e^ sun, in ye time of an Eclipse, is hindered from falling on it, by ye Interposition of y^e^ Earth, y^t^ it shou'd by y^t^ means be made totally dark, and so intirely disappear, while it is immers'd in y^e^ Earth's shadow, w^ch^ w^d^ accordingly happen, if ye Earth had no transparent Atmosphere about : But by means of ye Earth's Atmosphere those rays of Light w^ch^ in their rectilinear passage w^d^ go beyond ye Regions of ye shadow, in passing out of ye Atmosphere into ye Ether are refracted from ye perpendicular to ye surface at ye point of Emergence, and

so are bent into another direction and penitrate & faintly illuminate ye Regions of ye shadow; and ye most refrangible rays being reflected at their Incidence on ye Atmosphere, ye Red and Orange, w^{ch} are ye least refrangible predominate amongst ye transmitted Rays, and so any Object (as ye Moon in these Circumstances) is illuminated only with these sort of Rays, and appears of a dusky red, or betwixt red and orange, but dusky withal, because of ye fewness of Rays."

Mr. ELSTOBB's lucid explanation is followed by two problems. Unfortunately the solutions are not disclosed.

April 18. 1732

Mr. ELSTOB's Series. Mr. WM. ELSTOB. junr. his series to be converted offer'd to ye Society.

$z = ay + by^2 - cy^3 + dy^4$ into this following viz :

$$y = \frac{z}{a} + \frac{bz^2}{a^3} + \frac{2b^2 + ac}{a^5} \cdot z^3 - \frac{5abc - 5b^3 + a^2d}{a^7} \cdot z^4$$

May 16. 1733

Mr. ELSTOB's Solution of a Problem

Communicated from Mr. WM. ELSTOB Jun^r in a letter to ye Secretary an ingenious Solution of ye following problem.

In the right cone ABC is given ye slant height.

AB = 50

and ye Diameter of its Base.

AC = 60

to find the Area of the greatest Parabola that can be cut out of ye said Cone.

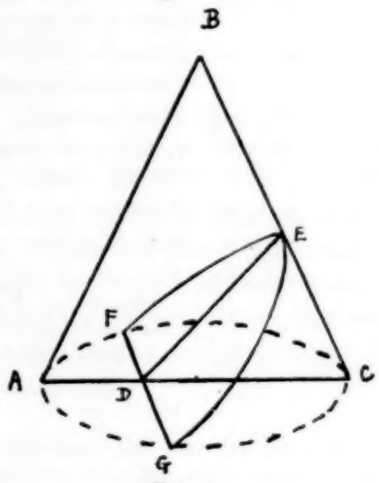

FIG. 2.

Acquisitions once more: —

June 6. 1733

" the Rev^d Mr. OTTE presented ye society with a neat silver medal of CONRADE GESNER M.D. on ye reverse his arms granted him by ye Emperour round w^{ch} this Inscript^n.

Archiat. Prof. Phys. Figurin In ye exerg. munific Aug. 1564.

June 20. 1733

S^r Is. NEWTON's Hist. of Prophecy.

Order'd y^t S^r ISAAC NEWTON in Daniel & ye Revelations be purchas'd for y^e Use of y^e Society.

A further record of Mr. ELSTOBB :

Sept. 25. 1734

Mr. ELSTOB's Solution of a Problem

The Secretary communicated a letter from Mr. WM. ELSTOB. in w^{ch} there is an ingenious solution of the following Problem.

If two ships sail from ye Equator at ye same time, whose distance is 450 miles, ye one sails due North at ye rate of 5 Miles per hour, and ye other or westernmost

ship sails at ye rate of 7 miles per hour. Quaere, what course must she steer to make ye shortest cut to ye other ship & w^{t} will be ye Property of ye Curve of her Course & w^{t} Latitude will they meet in?

Two controversial questions then appear, the problem of the Aurora Borealis, and of the Calculus still not entirely accepted (3).

March 12. 1735

Solution of y^{e} Aurora Borealis

The Secretary communicated two letters from Dr. BALGUY at London Feb. 15 and March 6 giving an ingenious account of w^{t} had been communicated to ye Royal Society whilst he was in Town viz: a Letter from a Swedish Gentlemen wrote in good English accounting for ye Phenomenon of ye Aurora Bor: from ye Refract: and Reflect: of ye Light of ye Moon by vapours congeal'd in air as Ye Rainbow is produc'd by Light of ye Sun: he propos'd to make an artificial Aurora to support his Hypothesis, as an artificial rainbow has been made to support ye other.

March 28. 1735

"The Secretary communicated part of a Letter from GEORGE LYNN Esq., of Southwick, objecting to ye solution of ye Swedish Gentlemen's Hypothesis of ye Aurora Borealis, referring us to Mr. De. MAIRAU's most ingenious conjecture in ye Philos: Trans: No. 431, who attributes those lights to ye different extensions of ye Sun's lucid Armosphere, and its sometimes blending with ours."

June 11 1735

"The Secretary communicated a letter to him from GEORGE LYNN Esq., of Southwick in w^{ch} ye Doctrine of Fluxions according to S^{r} Is. NEWTON is set forth in a plain and accurate manner, in answer to ye objection of ye Author of ye Analyst who has spent almost a whole Treatise in carping at y^{t} Method as not demonstrative on account of ye rejecting ye term $\dot{x}\,\dot{y}$"

Then follows a lengthy statement of Mr. LYNN's arguments which extend over three pages of the Minute Book, with two diagrams.

Here are two interesting entries of a different type.

Dec^{r}. 15 1736

A proposal from the Rev^{d} Dr. HALES communicated by Dr. BALGUY "for an Experiment of trying y^{e} different degrees of restringency of medicines, by moistening long animal fibres with them when equal weights, just sufficient to make them strait, are hung to them..." followed by a description of same.

Octr. 12. 1737

The Secretary communicated the underwritten Eulogy upon S^{r} Is. NEWTON by a Learned Hand.

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(3) Controversy was still going on, and Bishop BERKELEY had attacked the conclusions of the calculus only the year before (1734).

Ille Hic est Newtonus
vir Summus
Qui Philosophiam naturalem
Fabellis verberumque portentis deformatam
veris clarisque. Idaeis instruait
Per Orbes in extricabiles
vorticosque insanos errantem
In finibus cortis conclusit :
Vacillantem et pedem figere resciam
In firmissime experimentum fundamente constituit
Et in deternum stabilirit
Eam demique Theologiae ancillantem
Et de Atheismo triumphantem
Orbi exhibuit.
Hermance Leientice Limites navit
Quousque progredi, datum sit
Et quad majus, ubi sisterdu,
Hinc uti se seire non superbuit
Ita nescire non erubuit
Nullius opinioni mancipatus
Minime omnium suae
Veri indagator et Arbiter
Falsi nihil aut intellectui ejus fraudem
Aut voluntati vim favore potuit
Adeo illum mens solers animasque integer
Undique tutum prostitere
Post lungam Annorum
In Doctrince Studijo promenendis
Erroribusque detegendis
Feliciter exactam
Placide tandem emigravit
Ad veri Rectique Originem
Fontemque perennem.

Now two entries relating to physics, one particularly interesting because it refers to LOEWENHOOK, and to the application of the microscope to the examination of the blood stream.

Jan. 14. 1741

" A letter from MAURICE JOHNSON Esq., Secretary of the Spalding Gentlemen's Society was communicated and contained an abstract of the minutes of their last two meetings viz : " A Discourse read there of a Magnetical power in a Bar of Iron according to its long continued position from Perpendicular for 15 years to Horizontal for as many months only by Dr. DESAGULIERS."

Feb. 10. 1742 LEWENHOOK's (LOEWENHOEK's) Microscopes.

" Mr. NEVE V. P. and 6 other members, Mr. COX communicated some remarks on Mr. LEWINHOOK's Microscopes, w^{ch} were made before ye R. S. by Mr. BAKER.

First he took notice of w^{t} MARTIN FOLKS Esqre had some time afore observ'd concerning their structure and use to

2. The Microscopes were 26 in number in a neat Cabinet wherein were 13 little

Boxs numberd from 15 to 27 two in each box being of one & ye same structure and y^t as simple as possible, having only a simple Lens with a pin first before it to fix it on ye object.

The greatest part of ye objects were destroy^d by time or accident.

To shew their magnifieing powers and measure their local distances, he made a Table of an inch scale divided into 100 parts, by w^{ch} it appeared y^t one of those magnifyers increas'd ye Diameter of ye object 160 times : and its superficies 25600, all ye rest fall short of that Degree. This Cabinet Mr. BAKER thinks to be ye 2d. of Mr. L-K's collection—design'd for dry objects—comparing these magnifiers wth six of Mr. FOLK's (lately made by Mr. CUFF) he found ye first, of Mr. FOLK's to magnifie six times as much as ye greatest of Mr. L-k's, and therefore is far from thinking y^t this was ye best cabinet of Mr. L. and that ye present glasses far exceed his &c.

Mr. BAKER then laid before ye Society 2 extraordinary improvements (viz : ye Solar or camera obscure Mic : and ye opake Mic : for ye invention of w^{ch} we are oblig'd to ye ingenious Dr. LIBARKIN, who when in England about 2 years ago shew'd to ye R.S. an apparatus of his own, since greatly improv'd by Mr. CUFF. wth w^{ch} Instrument and some additional contrivance of Dr. A. STEWART's he had ye pleasure to see ye veins and arteries in ye mysentery of a Frog magnified to near 2 inches Diameter, and ye globules of Blood rolling thro' them as large as pepper corns &c."

The motion of blood in the mysentery seems to have created considerable interest. Finally, an astronomical note :

Feb. 15. 1755

At this meeting was communicated " Mr. WHISTEN's Plan of ye Path of ye Present Comet Feb. 4. from its first appearance Dec. 23 when its distance from ye Earth was 80 millions of miles, from ye Sun 100 millions. Feb. 4 about 50 millions of M. from ye Earth, about ye same from ye Sun, Feb. 16, will be its perihelion, distant 30 mil. of miles. Its tail is about 12 millions of miles long."

Minutes continued to be kept until 1809 (4), but the later ones contain less detail and are mainly concerned with affairs of the Society itself rather than with the subjects under discussion : consequently they are of less interest to the historian of science. The above entries have been supplied with very little comment, and arranged chronologically as in the actual Minutes; it was felt that they were o^f sufficient interest in themselves independent of elaboration and classification.

Newton Abbot, Devon, England. H. J. J. WINTER.

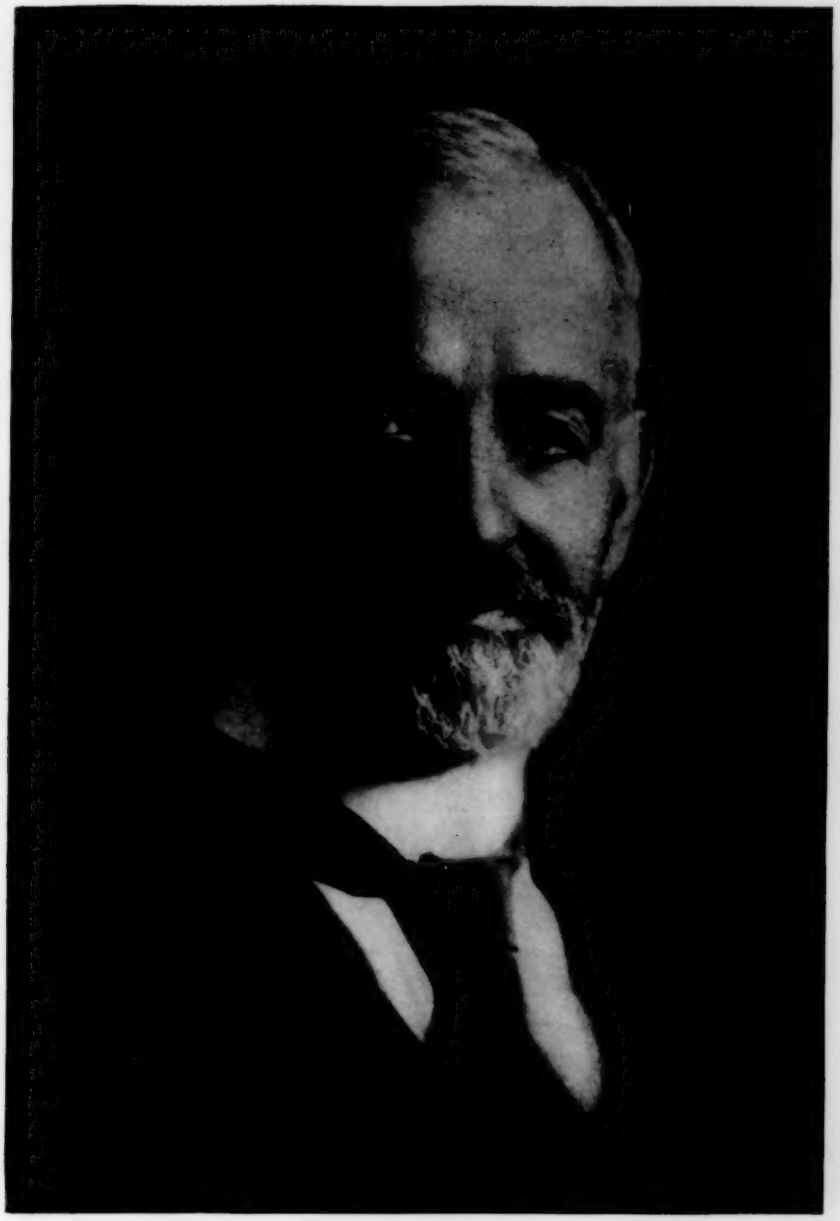
(4) At that time some 25 members attended the meetings, but the Society, unlike its forerunner at Spalding, has since ceased to meet.

Harry Walter Tyler

A pioneer in the history of science movement in the United States, H. W. TYLER devoted forty years of his life to the interests of the Massachusetts Institute of Technology, with which he was identified from his undergraduate days until he retired from active teaching. He was influential in promoting throughout the country improved methods of education in mathematics, and for many years he was engaged in organized effort to protect the freedom of academic thought and instruction.

He was born April 16, 1863, of old New England rural stock in Ipswich, a small town of northern Massachusetts, to which his father, DAVID M. TYLER, had migrated from New Hampshire to engage in the business of watch-maker and jeweller. His mother, HARRIET WILLCOMB, was the daughter of a merchant of the town. At the age of seventeen, after preparation at the Ipswich High School and, it is said, reading Latin and Greek with the village minister, TYLER matriculated at the Massachusetts Institute of Technology, then in Boston. There he specialized in chemistry, at the same time taking all the advanced courses that were offered in mathematics, and serving on the editorial staff of a newspaper conducted by the undergraduates. Having presented a thesis on "The Decomposition of Hexane at High Temperatures," he was graduated Bachelor of Science in 1884; and, declining an assistantship in chemistry, was appointed Assistant in Mathematics. In 1886 he was advanced to the grade of Instructor, and in 1887, having obtained leave of absence, he married a classmate, ALICE IRVING BROWN. They went abroad and he studied for a year at Göttingen, where FELIX KLEIN was professor of mathematics, and then at Erlangen under PAUL GORDAN and MAX NOETHER. His dissertation was on "Beziehungen zwischen der SYLVESTER'schen und der BÉZOUT'schen Determinante" and he was admitted to the degree of Doctor of Philosophy in 1889.

Returning to the Institute of Technology, TYLER served for a



HARRY WALTER TYLER
(1863-1938)
Foundation Member, History of Science Society

Isis, XXXI (1), pl. 1. ROBERT P. BIGELOW

year as Secretary of the Faculty; and then resumed teaching as Assistant Professor, and was advanced rapidly to Associate Professor in 1892 and Professor of Mathematics in 1893. In 1891, however, he was persuaded by President WALKER to accept three positions—Secretary of the School, Clerk of the Executive Committee of the Corporation, and Secretary of the Faculty. (At that time there were two other Secretaries—of the Corporation and of the Society of Arts, the latter a coordinate part of the Institute organized before the School.) For the next ten years TYLER was known as " The Secretary of the Institute," and in that capacity was consulting officer with the president, in charge of all business (except financial), responsible for all matters of routine, assignment of rooms, admission of students, enforcement of rules, records, publications, etc., and the general correspondence of the Institute; as well as the preparation of business for Faculty meetings, and service on numerous committees. For this immense task, which grew with the years, he was equipped with a wonderful memory, a ready grasp of detail, rare judgement and wisdom, and exceptional executive ability. These qualities, with his tact and untiring industry, made his services to the Institute invaluable. It is during this formative period that his influence upon the development of the school is most clearly seen.

Nevertheless—perhaps as a relief from the strain of official duty—he found time for extramural activities. His innate love of mountaineering led him to active membership in the Appalachian Mountain Club, of which he was president in 1909. He was Secretary of the M.I.T. Alumni Association, 1892-1897 : was one of the founders of the Technology Club in 1896; and was chairman of the Walker Memorial Committee from 1897 until the completion of the building, devoted to student activities, in 1916 on the new site of the Institute in Cambridge. He was a member of the American Mathematical Association, a founder of the Association of Teachers of Mathematics in New England, and a member of the Society for the Promotion of Engineering Education. As one of the founders in 1901 of the College Entrance Examination Board, he was always active in its affairs, and was Vice-Chairman at the time of his retirement from the Institute. He was elected in 1902 Fellow of the American Academy of Arts and Sciences, and Corresponding Secretary 1915-1924; and in

1904 was a delegate to the International Congress of Mathematics at Heidelberg. When the autonomy of the Institute was threatened he was an ardent, fearless, and successful champion of independence.

During the administration of President PRITCHETT there was considerable reorganization in the Institute. JOHN D. RUNKLE, Walker Professor of Mathematics, had been associated with WILLIAM BARTON ROGERS in the founding of the Institute and was the professor of mathematics when the School opened. Later other teachers of the subject were added to the staff, but instruction continued without formal organization until 1902, when RUNKLE retired and TYLER was appointed head of the department. He at once took an active part in the teaching, and initiated new policies in method and cooperation. This was made possible by the creation of several new officers to take over general administrative details formerly intrusted to the Secretary. In 1906 the office of Secretary of the School was abolished and another Secretary of the Faculty was elected.

The next year TYLER joined with W. T. SEDGWICK in giving an elective course for undergraduates on the History of Science, and after SEDGWICK's death he continued in charge of this course until he retired. Their well-known text-book, *A Short History of Science*, appeared in 1917. TYLER was one of the scholars who gathered in Boston in 1923 at the invitation of Professor DAVID EUGENE SMITH to found the History of Science Society, and he thus became a Foundation Member when the Society was organized in 1924. He was a member of the Council, 1925-1927, second Vice-President in 1929, and in 1930 Chairman of the Program Committee for the commemoration of the tercentenary of the death of JOHANN KEPLER. Although his dislike for prominence prompted him in 1930 to decline the presidency, he was thoroughly interested in the affairs of the Society, giving much time and attention to it, as well as to its official publication, *Isis*. His activities in this connection were of vital importance for the growth of the history of science movement.

TYLER was named Walker Professor of Mathematics in 1910, and was Chairman of the Faculty of the Institute from 1913 to 1915. When he retired in 1930 with the title, Walker Professor, Emeritus, the Department of Mathematics under his wise guidance had become one of the first rank in this country.

Having been appointed Consultant in Science at the Library of Congress, he moved to Washington. There he soon made a place for himself in the hearts of the alumni. He became President of the Washington Society of M.I.T. With his delightful sense of humor and winning leadership his fellow alumni would have no other one for their president until he died.

In Washington he established the headquarters of the American Association of University Professors, of which he had been a charter member and since 1916 its General Secretary—a position for which he was uniquely fitted by his energy and patience, initiative and caution, dignity and a dry and penetrating humor; combined with a sense of perspective, the art of pithy and concise phrasing and keeping to the essentials of a case, and a happy temperamental gift of imperturbability. In 1918 he had represented the Association in the creation of the American Council on Education. He was Vice-President of the Association in 1934 and 1935, and edited the *Bulletin* until July 1, 1937. Shortly before his death he had completed important chapters on " Academic Freedom " for the *John Dewey Yearbook* and for the Social Science Research Council.

The Library of Congress, where he was Honorary Consultant from 1932 on, afforded excellent facilities for the revision of the *Short History of Science*. The preparation of a new edition was undertaken with the help of R. P. BIGELOW, as joint editor, and the work was very nearly finished at the time of his death. After Mrs TYLER died in 1937 he resided at the Cosmos Club, where on February 3, 1938, heart failure suddenly ended a life filled to an extraordinary extent with useful activity. " Maximum usefulness rather than least resistance " was its guiding thought.

Massachusetts Institute of Technology. ROBERT P. BIGELOW.

BIBLIOGRAPHY

Beziehungen zwischen der SYLVESTER'schen und der BÉZOUT'schen Determinante. Dissertation Univ. Erlangen. München, 1891.

Entertainments in Chemistry. Easy lessons and directions for safe experiments. Boston, 1886.

Educational Work of FRANCIS A. WALKER. *Educ. Rev.* June, 1897.
Famous Technical Schools—V. Massachusetts Institute of Technology. (with R. C. MACLAURIN). *Technical Jour.* London, *8*, 50-64, 1915.
The International Congress of Mathematics at Heidelberg. (with E. B. WILSON). *Bull. Amer. Math. Soc.*, *11*, 191-263, 1905.
JOHN CUMMINGS, Treasurer. *Technology Review*, *1*, 184-189, 1899.
JOHN DANIEL RUNKLE. *Technology Review*, *4*, 277-306, 1902.
Mathematics in the Technological Schools of Collegiate Grade in the United States. *U.S. Bur. Educ. Bull.* 1911, no. 9.
On the Course in the History of Mathematics in the Massachusetts Institute of Technology. *Bibliotheca Math.* (3) *10*, 48-52, 1910.
Over the Carter and Twin Mountain Ranges. *Appalachia*, *9*, 302-9, 1900.
The Relation of the School of Technology to General Education. *Technology Review*, *5*, 426-440, 1903.
Report of Section on Mechanic Arts. *U.S. Office of Exper. Stations Bull.* 115, pp. 33-40, 1902.
Report of the Committee... on Definitions of College Entrance Requirements. *Amer. Math. Soc. Bull. 10*, 74-77, 1903.
A Short History of Science. (with W. T. SEDGWICK). New York : MACMILLAN, 1917.

Puritanism, Science, and Christ Church

Within the last few years various articles and books have thrown considerable light upon the close relationship between science and Puritanism in the seventeenth century (1). In fact, one may assert with some confidence that the Puritans were the chief supporters of science before the Restoration, and left their indelible stamp upon its subsequent development. In a recent examination of the THOMASON Tracts, I came upon a pamphlet, which, as far as I know, has not been discussed before, and which in a clear and unmistakable fashion illuminates this relationship, and that too in a way most characteristic of the Puritans, namely, education (2) : *Sundry Things from severall hands concerning the University of Oxford: viz.* I. *A Petition from some well-affected therein.* II. *A Modell for a Colledge Reformation.* III. *Queries concerning the said University and severall persons therein.* 1659. (THOMASON has dated it June 29). In the treatise the authors are revealed as staunch Puritans, who claim for their motive an ardent desire to make the University of Oxford render better service to Church and State. It is the second article, " A Modell for a Colledge Reformation," which is of especial interst, for it proposes nothing less than that Christ Church should be thoroughly overhauled, the dean and canons abolished, and the funds used for establishing what is essentially a new college, in which one third of the fellows, or twenty in all, should study physic, geography, and the like for the express purpose of becoming " exact virtuosi," a term which, of course, was applied to the experimental philosophers. The important stipulations in the proposal are as follows :

(1) See particularly ROBERT K. MERTON, *Science, Technology, and Society in Seventeenth Century England* (*Osiris*, Vol. IV, part 2, 1938), and RICHARD F. JONES, *Ancients and Moderns* (Washington University *Studies*, New Series, Lang. and Lit. No. 6, St. Louis, 1936).

(2) See JONES, *op. cit.*, Chap. V.

Let there be established in the Colledge one or two Professors in Divinity, who shall furnish such a course therein as shall be thought fit, especially instructing all in the several Analysis of faith, and grounds of religion : let him or they uphold Disputations and such like exercise.

Let there be a Professor of Civil Law and Politiques, who may instruct all in true foundations of common right, and dispose them to prefer a Commonwealth before Monarchy : let him direct them in a method of particular Politiques and History.

Let there be one Professor in *Des Cartes'* Philosophy and Mathematicks.

Let there be one Professor of *Gassenduus's* Philosophy, and General Geography, who may also give directions for particular Geography.

Let these each have assistants out of the Fellows (to be constituted) who enquire into the Magnetical Philosophy; let them have a school of Experiments in Optiques and Mechaniques for the instruction of the Gentry, and such as it shall be found suitable to assist them in their studies : and let this be defrayed by the publick, or by levies upon each Commoner that comes to study there, as they now give pieces of Plate.

Let there be a Professor of Physick, and another of Anatomy; let them read, dissect, and keep a Chymist for experiments and promoting of Medicines : let this be defrayed partly by levy upon the students in Physick, and such as shall desire to be present, and partly by the standing Apothecary of the Colledge of Physicians.

Let there be a Professor of useful Logick, and civil Rhetorick, for the institution of such as are to be employed in the publick : and let them practice not in a declamatory and light, but a masculine and solid way, that is (in) English as well as Latine; and that they be instructed in the way of penning Letters and Dispatches.

Let all or any of these teach such as are not versed in Latine, in English, and let such be distributed into agreeable company, for the bettering themselves : and let the Professors be severely prohibited from teaching any that shall be young and not of their Colledge : as for such as are grown in years, and yet would learn any, or all the studies aforesaid, they may be admitted and disposed of according to discretion, without prejudicing the constant course of studies to be upheld in the Colledge.

The second paragraph makes it clear that as far as politics were concerned the Puritans felt little interest in academic freedom, whatever they might hold in scientific matters. The naive requirement that the professor of political science should dispense propaganda for the Commonwealth, at that particular time rendered insecure by the death of CROMWELL, strikes a modern note. The elevation of English to a place of equal importance with Latin in teaching and academic exercises is quite in keeping with the high regard which the Puritans felt for the English language and with their insistence upon its importance, an attitude inspired largely by their utilitarian spirit. The emphasis upon utility is also clearly manifested in " useful Logick " and " civil Rhetorick," terms which would deny all purely intellectual satisfaction or esthetic delight.

At the time that this treatise was published various schemes for a scientific institution were in the air (3). SAMUEL HARTLIB was still clinging to his long held idea of " Macaria;" in a letter to BOYLE, September 3, 1659, EVELYN outlines a scientific organization; in the *New Atlantis*, 1660, one who signs himself R. H. describes yet another; and the next year COWLEY published an elaborate description of a scientific college in *A Proposition for rhe Advancement of Experimental Philosophy*, which, SPRAT says, hastened very much the founding of the Royal Society (4). The present treatise, which emphasizes even further the movement which resulted in the Society, differs from the other propositions in two or three important respects. First, the expression " by several hands," found in the general title, suggests that even though this particular proposal may be by a single author, there was a community of interest in the new science among the Puritans which presents a much more forceful argument for the part which the Puritans played in the development of the experimental philosophy than any work by a single author could furnish. The present treatise also is much more definite and practical than the other schemes for a scientific institution. Instead of laying out a plan which would necessitate building from the ground up, and which would involve the receiving of funds from some unknown source, it proposes that an institution already in existence be taken over, and that its very real funds be diverted from their futile (in Puritan eyes) employment to support of the reconstructed scientific college. And finally, the selection of Christ Church, which became, and perhaps was at the time, the most conservative college in Oxford, is in itself interesting when we remember that it was this college which near the end of the century supported Sir WILLIAM TEMPLE in his efforts to advance ancient learning against modern science.

Washington University,
Saint Louis.

RICHARD F. JONES.

(3) JONES, *op. cit.*, pp. 178-183, 332-333.
(4) *History of the Royal Society*, p. 59.

A hitherto unnoticed criticism of astrology

Liber de reprobatione iudiciorum astrologiae

In a Vatican manuscript of the second half of the fourteenth century or the early years of the fifteenth is an anonymous criticism of astrology which seems not to have been hitherto noticed. (1) It is the second item in the manuscript and from the fact that it is preceded by the *De configuratione qualitatum* of NICHOLAS ORESME, which is also anonymous here (2), and that it shares some of the characteristics of ORESME's several known attacks upon astrology, might be thought to be by him or HENRY OF HESSE or someone of their school. It may also be recalled that WALTER CATO, penitentiary to JOHN XXII, is said to have written a work against astrologers (3) that does not seem to have come to light. Or our work may be by BERNARD OF VERDUN, since, as we shall see, an anonymous astronomical treatise which immediately follows it is by him. If the criticism of astrology is also by him, it would date about 1300, long before ORESME and HENRY OF HESSE.

In the previous paragraph we alluded to our text as a criticism of astrology, and it so starts off in the Vatican manuscript. But the title, *Book of Reprobation of Astrological Judgments*, really does not apply to the entire text. Towards the end there begins a " Third Part on Natural Astronomy (or, Astrology), How God Disposes Inferior Bodies by Superiors " (4). Moreover, a first part is

(1) Vatic. lat. 3097, fols. 23*r*, col. 1-50*v*, col. 1 : " Incipit liber de reprobatione iudiciorum astrologie. Distinctio prima de reprobatione iudiciorum astrologie in generali per auctores et rationes sacre scripture. Nunc ad intelligendum qualiter iudicia sint spernenda penitusque repudianda stilum nostri sermonis vertimus.../... virtus fortitudo potestas et imperium per infinita secula seculorum. Amen." The remainder of fol. 50*v* is blank.

(2) *Ibid.*, fols. 1*r*-22*v*, col. 1.

(3) WADDING, *Scriptores ordinis minorum*, editio novissima, Rome, 1906, p. 102.

(4) Vatic. lat. 3097, fol. 45*v*, col. 2 : " Tertia pars de astronomia naturali

missing in which the anonymous author set forth the method by which astrologers arrived at their judgments. The opening words of the present text (5) suggest a transition from a preceding section, and later on the author refers to what he said on the natures and significations of the fixed stars in Distinction 6 and on the places of nativity and habitation of diverse nativities and their movements in Distinction 10, first chapter (6). These references do not fit any of the divisions of our present text and apply to sections of the aforesaid missing first part (7). Briefly then the plan of the work was as follows. First, the methods of judicial astrology were set forth as a basis for subsequent criticism of the art. Then came the second part of reprobation of judicial astrology. But then in conclusion the edge was taken off this criticism by approving natural astrology and censuring only superstitious astrology.

The extant text in our manuscript is divided into thirty-three Distinctions, of which the first twenty-six deal with the reprobation of astrology, while the last seven (27-33) expound natural astrology. Some are subdivided into chapters. I list herewith their Latin titles where these are given, with the opening words of each chapter and indication of the page and column of the manuscript where each begins.

Dist.	Cap.	Fol., Col.	
1		23*r*-1	De reprobatione iudiciorum astrologie in generali per auctores et rationes sacre scripture.
	1		Nunc ad intelligendum qualiter iudicia sint spernenda penitus...
	2	23*r*-2	Beatus Augustinus libro de doctrina christiana ubi arguit de artibus magorum...
	3	23*v*-1	Quod autem non a constellationibus sed a voluntate hominis...
	4	24*r*-1	Idem Augustinus 5 de civitate dei non immerito creditur cum astrologi multa vera...

quomodo deus per superiora corpora disponit inferiora. Postquam de astrologia superstitiosa processit narratio consequenter de indagatione astrologie naturalis."

(5) Quoted in note 1 *supra*.

(6) *Ibid.*, fol. 47*r*, col. 2-47*v*, col. 1.

(7) Once reference is made to a Distinction of the Second Part, but first must be meant : *Ibid.*, fol. 35*v*, col. 2, Dist. 15 opens, " In distinctione 3*a* secunde partis agitur de significationibus 12 signorum et in divisione zodiaci per 360 gradus."

Dist.	Cap.	Fol., Col.	
	5	24*v*-1	In supradicta vero auctore Augustino de civitate dei sequitur nota horoscopi notati...
2		24*v*-2	De reprobatione vero tam eorum qui iudicia tradiderunt quam ipsorum iudiciorum probando eos esse fidei nostre blasphematores et infideles mendaces...
3		25*r*-2	Utrum stelle actus humanos habeant significare tantum secundum astrologos autem efficere.
	1		Illud quoque pretermittendum non est quod astrologi blasphemando dicunt...
	2	25*v*-1	Quibus resistandum est probando stellas non ita efficere in inferioribus ut posse immutare hominis voluntatem...
	3	26*v*-1	Et quod operatio corporum superiorum sit naturalis et non per electionem...
4		26*v*-1	Utrum omnia de necessitate contingant.
	1		Dicunt etiam astrologi blasphemando quod omnes actus humani et mores...
	2	27*r*-1	Nudatis (?) blasphemiis sicut est iustum eos rationibus communicamus...
	3	27*v*-2	Auctores etiam astrologi aliquando sibi ipsis sunt contradicentes...
5		28*r*-2	Utrum corpora celestia sint animata.
	1		Quidam autem philosophorum dixerunt animas esse creatas ab intelligentiis...
	2	28*v*-1	Quod autem non sint animata corpora celestia probatur sic...
6		28*v*-2	Utrum sola virtute divina miraculose an etiam aliqua virtute possint impediri ea que predicuntur ab astrologis ne eveniant.
			Fortasse dicet aliquis astrologorum...
7		29*r*-1	Utrum de futuris contingentibus sit scientia et an huiusmodi valeant ab astrologis veraciter pronun'iari.
		29*r*-2	Et quod de futuris contingentibus ad utrumlibet non possit esse scientia...
8		29*v*-1	Utrum gratia et virtutes animi necnon et bona exteriora que agunt homines constellationibus sint attribuenda.
	1		Hoc solum de precedentibus apparat (*sic*) infidelitas eorum qui iudicia tradiderunt...
	2	29*v*-2	De predictione vero dicit Alkabitius quod Mercurius (?) est significator...

Dist.	Cap.	Fol., Col.	
	3		De elemosinarum largitione dicit Cahel ben Bisr israhelita in libro suo...
	4		De cultu unius dei Alkabucius (*sic*) secunda differentiarum sic dicit...
9		30*r*-2	Utrum scelera ex dispositione syderum perpetrentur.
	1		Contra stellis malivolis attribuunt scelera de vitio sodomito dicit Ptolomeus...
	2	30*v*-1	De cultura ydolorum dicit Alkabitius secunda differentiarum libri sui...
	3		Et sicut de peccato ydolatrie ita de ceteris facinioribus...
10		30*v*-2	Quod vanum et superstitiosum est fundamentum iudiciorum que a fabulis poetarum ducunt originem.
	1		Est preterea sciendum ad astrologorum infidelitatem monstrandam quod superstitiosum...
	2	31*r*-1	Est miranda dementia gentilium qui non solum pisces...
	3	31*r*-2	Ex predictis apparet dementia et infidelitas astrologorum..
11		31*v*-1	De reprobatione magni anni.
	1		Nunc superest investigare de questione magni anni quidam namque...
	2	31*v*-2	Contra quos obicitur a privatione adah bitum non est regressus secundum naturam...
	3	32*r*-2	Iterum ex magni anni positione sequitur alius error scilicet quod mundus sit eternus...
12		32*v*-1	Quod auctores iudiciorum sunt mendaces sibique invicem contradicentes.
	1		Deprobatis astrorum iudicibus tamquam infidelibus et blasphemis...
	2	33*r*-2	Deinde in tertia differentia subiungit Albumazar supradictus...
	3		Et sicut Albumazar dixit Ptolomeum esse mendacem ita ipse Ptolomeus dixit alios auctores esse mendacissimos...
	4	33*v*-1	Preterea in exaltatione planetarum plurimum discordant...
	5		Contradicunt etiam sibi Dorothius et Ptolomeus sicut dicit Omar in libro nativitatum...
	6		Amplius inter antiquos fuerunt multe opiniones de effectibus planetarum...

Dist.	Cap.	Fol., Col.	
13		33*v*-2	Quod doctores seu auctores magisterii astrorum fuerunt insipientes ac ydiote ac multa puerilia et irrationabilia risuque digna in scriptis suis relinquentes.
	1		Postquam probavimus eos fuisse infideles et mendaces consequenter manifestanda est eorum insipientia...
	2	34*r*-1	Deinde subiungit Albumazar quod gemini est signum magnatorum...
	3	34*r*-2	De significatione vero partium humani corporis the question marh should go with scelerata(?) est eorumtraditio..
	4		Amplius inveniuntur multa in scriptis eorum tam pueriliter et insipienter tradita...
	5		Alkabicius prima differentia dicit in ariete saturnus habet pectus iupiter...
	6	34*v*-1	Albumasar vero dicit quod mercurius significat delectationes et habundantiam...
	7	35*r*-1	Zahel autem mirum stolide ac insipienter et nichilominus malitiose loquitur...
14		35*r*-1	De reprobatione proprietatum et significationum 12 domorum.
	1		Postremo ad reprobationem in generali tam iudiciorum quam eorum qui iudicia confinxerunt...
	2	35*r*-2	Inchoemus a reprobatione eorum que dicuntur in distinctione (x) partis secunde huius operis...
	3	35*v*-1	Rursum Ptolomeus dicit libro 2º de iudiciis capitulo 24 cum planete in medio celi fuerunt...
	4		Deinde assignatur ratio domorum et assignaverunt primam domum...
	5	35*v*-2	De morte vero redditur talis ratio Mars est in tertio circulo et ipse et Saturnus sunt similes...
15		35*v*-2	De reprobatione positionis et significationis duodecim signorum.
	1		In distinctione 3ª 2ª partis agitur de significationibus 12 signorum et in divisione zodiaci...
	2	36*r*-1	Amplius Zahel dicit quod 6 sunt signa masculina et 6 feminina Albumasar vero...
16		36*r*-1	De reprobatione aspectuum. Consequenter ad reprobandum regulas de aspectibus accedamus...

Dist.	Cap.	Fol., Col.	
17		36*r*-2	De reprobatione significationis planetarum.
	1		Predictis adiciendum est de significationibus...
	2	36*v*-1	Rursum Albumasar ostendit quis trium planetarum i.e. Iovis Veneris et Mercurii.
	3	36*v*-2	[Z]ahel quoque dicit quod planeta retrogradus significat inobedientiam et contradictionem...
18		37*r*-1	De reprobatione dignitatis et potestatis planetarum in signis.
	1		Sciendum est etiam quod planete dicuntur habere quasdam potestates et dignitates in signis...
	2	37*r*-2	Albumasar vero ponit rationem Ptolomei de domibus Cancer est domus lune quia...
	3	37*v*-1	Illud quoque diligenter considerandum est quod astrologi in suis argumentationibus probant ignotum per ignotius...
	4		Zahel insuper dicit quod fortuna in 8 ab ascendente non operatur neque bonum neque malum...
19		37*v*-1	De reprobatione fati et casus.
	1	37*v*-2	Postquam premisimus de iudiciorum reprobatione in generali nunc ad ipsorum confutationem secundum diversos rationes...
	2	38*r*-1	Nichil igitur in mundo fit preter intentionem et providentiam cause prime...
	3	38*r*-2	Quod autem deus benedictus regat ac gubernat totam machinam mundialem...
	4		Nunc autem specialiter de corporibus universis quod regantur non per fatum...
	5	38*v*-1	Item quod humani actus divine providentie subdantur...
20		38*v*-2	De reprobatione fatalium siderum inspecta nativitatis hora per rationes sumptas ex dictis sanctorum Augustini Gregorii et Ambrosii.
	1		Sancti quoque doctores ecclesie Augustinus Ambrosius Gregorius validissimis rationibus...
	2	39*r*-1	Contra primum modum obicitur secundum beatum Augustinum...
	3	39*r*-2	Ceterum (?) dicet fatalium siderum assertor quod propterea inter geminos invenitur diversitas...
	4	39*v*-2	Ex premissis colligitur quod secundum eorum falsam opinionem de inveniendo puncto...

Dist.	Cap.	Fol., Col.	
	5	40*r*-1	Beatus vero Ambrosius in exameron multipliciter ipsorum redarguit insipientiam...
	6	40*r*-2	Ad idem beatus Gregorius in omelya ephyphanie...
21		40*v*-2	De reprobatione iudiciorum qui dantur considerata conceptionis hora.
	1		Quia vero maiorem vim constituunt astrologi in cognitione hore conceptionis...
	2		Ceterum (?) dicet astrologus cognita nativitatis hora per novem menses integros...
22		41*r*-2	De reprobatione regularum in speciali super conceptionibus et nativitatibus hominum.
			Quedam insuper astrologi rimantur in conceptionibus et nativitatibus...
23		41*v*-2	De reprobatione dictorum Ptolomei circa mores diversarum gentium...
			Quot autem leges varie secundum provincie diversitatem necnon et mores...
24		42*v*-2	De reprobatione iudiciorum que procedunt inspecta interrogationis hora.
	1		Post predicta contra inspectiones interrogationum procedendum est...
	2	43*r*-2	Obicitur similiter contra hoc quod Cahel et Messahalla dicunt...
25		43*v*-2	De reprobatione iudiciorum que investigantur per modum electionis.
	1		Nunc superest investigare qualiter electiones valeant reprobare (*sic.*)...
	2	44*r*-1	Amplius totam vim electionis constituunt in puncto vel inchoationis vel...
	3	44*r*-2	Preterea velit nolit homo corpus eius calescit sole existente in leone...
26		44*v*-1	Quod multum falluntur astrologi non recte de accidentibus aeris et de quibusdam aliis rebus corruptibilibus iudicantes.
			Confutatis per supradicta iudiciis Caldeorum que sunt contra fidem catholicam...
(27)		45*v*-2	Tertia pars de astronomia naturali quomodo deus per superiora corpora disponit inferiora (8).

Dist	Cap.	Fol., Col.	
			Postquam de astrologia superstitiosa precessit narratio consequenter de indagatione astrologie naturalis...
28		46*r*-2	De investigatione accidentium aeris.
			Incipientes aeris actus precognoscere considerant que signa sunt ignea vel aerea aquea vel terrestria...
29		46*v*-2	De multiplici effectu signorum zodiaci.
			Restat nunc particulares rerum naturas assignare sicut dicit Ptolemeus...
30		47*v*-1	De signaculis circa stellas quid significent.
			Postquam premisimus de effectibus quos habent stelle per naturam producere...
31		47*v*-2	De signaculis circa solem et quid significent.
			De signaculis vero que sunt circa solem Ptolomeus ultimo capitulo libro 2º quadripartiti...
32		48*r*-1	De signaculis que apparent circa lunam cuiusque multiplici effectu in istis inferioribus.
	1		Postremo de signaculis que apparent circa lunam eiusque multiplici effectu in inferioribus...
	2	48*r*-2	Insuper circa materiam istam traditur hec doctrina...
	3		De multiplici vero effectu lune dicit Ptolomeus...
33		48*v*-1	De proprietate significationis lune super accessum et recessum maris.
	1		Quoniam magis universalis significatio lune est super aquam et terram...
	2	48*v*-2	Idem quoque Albumasar 3º libro differentia 5 assignat plures causas...
	3	49*r*-2	Ad sciendum vero fortitudinem accessionis et eius debilitatem 8 sunt consideranda...

As the foregoing captions indicate, our author repeats the arguments of the church fathers against astrology, he charges the art with teaching fatal necessity—which most astrologers would deny,—he maintains that future contingents and acts of intellect and will are not under the stars—which most medieval astrologers would admit,—he rejects the doctrine of the *magnus annus* or history repeating itself, he attacks the personal character and intellectual ability of astrologers, and he makes an elaborate onslaught upon the methods, rules and technique of astrology

(8) This seems to take the place of Distinctio 27, which I could not find indicated.

worthy of ORESME or PICO DELLA MIRANDOLA. On the other hand, some of the arguments advanced by ORESME in his various writings against astrology find no place in these captions : for example, its uncertainty because of our inexact and incomplete knowledge; the limitation of celestial influence to heat and light and denial of any occult or qualitative influence; the emphasis upon the tricks and deceits of astrologers. However, ORESME did not give all his arguments against astrology in each treatise that he wrote on the subject, so that the omission of some of them in our present treatise is no sure proof that it is not by him. Perhaps the most original position of our anonymous work is its criticism of PTOLEMY's dicta as to the characteristics and morals of different peoples and races.

Our anonymous author shows a wide acquaintance with astrological literature, citing ALBUMASAR, MESSAHALLA, ZAHEL, ALCABITIUS, and DOROTHEUS. Perhaps he is inclined to judge astrology too much by its ancient and Arabic exponents. He quotes AUGUSTINE and AMBROSE repeatedly against astrology but passes over in silence the much more favorable attitude to the art of ALBERTUS MAGNUS and AQUINAS. He does, however, criticize " the venerable father, master RAYMOND " (DE PEÑAFORT?) " illustrious for his admirable knowledge of sanctity and religion," for having said in his *Summa* that possibly thefts could be investigated by inspection of the astrolabe without invoking demons or other superstition (9). He notes that GAUFREDUS in his *Summa* contradicts RAYMOND on this point. (10)

When our author turns from " superstitious " to " natural " astrology, he sings a different tune. Now he cites AUGUSTINE as accepting the influence of superior over inferior bodies, and himself grants that celestial bodies move terrestrial ones (11). Now he quotes with approval ARISTOTLE as stating in his *History of Animals* that all diversities in conceptions are from the celestial bodies, and RABBI MOSES (MAIMONIDES) as saying that the sky functions in the universe as the heart does in the body (12). Now

(9) Vatic. lat. 3097, Dist. 1, cap. 5, fol. 24*v*, col. 1.
(10) *Ibid.*, fol. 24*v*, col. 2.
(11) Vatic. lat. 3097, fols. 45*v*-46*r*.
(12) *Ibid.*, fol. 46*r*, col. 2.

he follows MESSAHALLA on conjunctions (13) and PTOLEMY's *Quadripartitum* (14). Before he had criticized the significations of planets and signs of the zodiac, the doctrine of aspects, and the dignity and power of the planets in the signs. But now he writes that beginners in weather prediction should consider which signs are fiery, which aerial, watery or terrestrial, and the conjunctions of the planets in those signs, and should especially consider the status of the moon when it is joined with Saturn or is in the head or tail of the dragon. For then the weather is apt to change, and the more if the moon or Saturn and the sun are in a cold sign, and still more so if one of them is next to the Hyades and Pleiades. Or instructions are given for drawing up a *figura coeli* (15). The discussion of " natural " astrology is limited to weather prediction and the influence of the moon on tides. Our author apparently does not care to face the question of celestial influence upon the body of the human animal. However, he quotes ALBUMASAR and AMBROSE as to the influence of the moon upon crops, fruit, trees, the clarity and purity of metals and gems, oysters, the brain and humors, as well as upon the tides.

Our text is followed in the manuscript by an anonymous astronomical work (16) which proves to be the *Speculum celeste* or *Liber super totam astrologiam* of BERNARD OF VERDUN (17), an able astronomer and Franciscan professor of about 1300. Thus the author of our text is in excellent company, although none of them is named in our manuscript, ORESME on the one hand and BERNARD OF VERDUN on the other. There then follows in our manuscript—and, like the others, anonymously—a short astrological tract which I have not identified or met before. (18) After several blank leaves comes a commentary on some such work

(13) *Ibid.*, fol. 46*v*, col. 1, *et seq.*

(14) *Ibid.*, fol. 46*v*, col. 2.

(15) *Ibid.*, fols. 46*v*, col. 1-2.

(16) Vatic. lat. 3097, fols. 51*r*, col. 1-72*v*, col. 2 : " Quia ex scientiis fructu dignioribus et ex loco ordinis .../... Explicit tractatus optimus super communia astrologica."

(17) *Histoire littéraire de la France*, 21, 317-20, and *Isis*, XIII (1929), 65-66, for the author and other MSS of the work.

(18) Vatic. lat. 3097, fols. 73*r*, col. 1-77*r*, col. 1 : " Scito quod ex revolutione anni mundi hoc est in introitu solis in caput arietis .../... infirmabuntur non tamen multi morientur. Explicit hoc collectum."

as the *Sphere* of SACROBOSCO (19); another commentary on ARISTOTLE's *De generatione et corruptione* (20), and the *Summa naturalium* (21), as it is here called, or *Philosophia pauperum*, which is often attributed to ALBERTUS MAGNUS and at least is based upon his books of philosophy (22). But these treatises are anonymous in our manuscript like all their predecessors. The last is in a later hand of the fifteenth century.

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LYNN THORNDIKE

(19) *Ibid.*, fols. 82*r*-102*r*.

(20) *Ibid.*, fols. 103*r*, col. 1-146*r*, col. 2. It opens, "Circa primum librum de generatione et corruptione notandum quod..." At fol. 141*v*, col. 2, we read: "Et sic dei adiutorio terminantur questiones super totum librum de generatione. Tota questio sequens pertinet ad primum de generatione aut illam questionem utrum generatio differat ab alteratione." The work ends, "Et sic complentur questiones super librum de generatione," rubric, "Expliciunt questiones super totum librum de generatione."

(21) *Ibid.*, fols. 147*r*-184*r*: "Phylosophia dividitur in tres partes scilicet loycam ethycam phisicam .../... Est liberum arbitrium facultas rationis et voluntatis qua bonum eligitur gratia assistente et malum gratia desistente et sic est finis istius summe. Explicit textus summe naturalium."

(22) See M. GRABMANN, "Die Philosophia Pauperum und ihr Verfasser ALBERT VON ORLAMÜNDE," *Beiträge z. Gesch. d. Philos. des Mittelalters*, XX (1918). P. MANDONNET, "ALBERT LE GRAND et la Philosophia pauperum," *Revue néo-scolastique*, XXXVI (1934), 230-62, reasserts ALBERTUS MAGNUS' authorship, regards *Compendium de negotio naturali* as ALBERT's own original title, and dates the composition of the work in 1244.

Notes and Correspondence

Question no. 83.—L'auteur et l'histoire de Roti-Cochon?

Mes études sur COMENIUS (voir *Isis* 31, 425-51) m'ont conduit à manier plusieurs éditions des ouvrages scolaires que l'on doit à ce grand homme et qui révèlent son génie pédagogique. Je pense à la *Janua linguarum re-*

ROTI-COCHON

OU

ME'THODE

TRES-FACILE

POUR BIEN APPRENDRE

LES ENFANS A LIRE

EN LATIN & EN FRANÇOIS,

Par des Inſcriptions moralement expliquées de pluſieurs Repreſentations figurées de différentes choſes de leurs connoiſſances; tres-utile, & même néceſſaire, tant pour la vie & le ſalut, que pour la gloire de Dieu.

A DIJON,

Chez CLAUDE MICHARD Imprimeur & Marchand Libraire à Saint Jean l'Evangéliſte.

FIG. 1.

serata (Leszno, 1631), au *Vestibulum* (Leszno, 1633), et aux innombrables éditions, traductions et adaptations qui ont suivi. Une des caractéristiques de ces humbles livres c'est leur inspiration élevée. La lecture du beau livre de GEORGES BOUCHARD sur *Guyton-Morveau, chimiste et conventionnel*

FIG. 2.

1737-1816 (Paris, PERRIN, 1938, p. 13) a attiré mon attention récemment sur un autre livre de lecture postérieur mais de caractère fort différent. Ce caractère nous est révélé tout de suite par le titre bizarre et populacier *Roti-cochon* (voir notre facsimile). C'est un petit livre de 36 p. (y compris le titre) qui fut publié à Dijon vers la fin du XVII^{e} siècle. Le but était d'apprendre à lire aux enfants et de leur donner des rudiments de latin

(voir la p. 15 que nous reproduisons). Les Bourguignons ont toujours eu la réputation d'être de grands amateurs de mangeaille, et il est clair que le maître d'école qui composa cet abécédaire ne pensait pas beaucoup plus loin. Un peu de religion, un peu de civilité, un peu de grammaire,

CIVILITE'
PUE'RILE
ET MORALE.

POUR inſtruire les Enfans, à ſe bien comporter, tant envers Dieu, que le Prochain: par des Figures Exemplaires ſur pluſieurs defauts & accidens qui leurs arrivent.

Tres-utile pour porter à l'Ecole, afin d'y aprendre à bien vivre & lire, ſoit en Latin ou en François.

A DIJON,
Chez C. MICHARD Imp^r. & Marchand Libraire à S^t. Jean l'Evangéliſte.

FIG. 3.

mais beaucoup à boire et à manger! Au *Roti-cochon* était adjoint un autre livret *Civilité puérile et morale* (aussi de 36 p. avec une nouvelle pagination), mais les deux livrets se vendaient aussi séparément.

On sait que les livres les plus méprisés à l'époque de leur publication ont beaucoup de chances de devenir plus tard les plus rares. *Roti-cochon* n'est pas une exception à cette règle. Il est, paraît-il, extrêmement rare

sinon unique. Un exemplaire en existe à la Bibliothèque de l'Arsenal à Paris, et a été reproduit en fac-similé en même temps que la *Civilité puérile* pour la Société des bibliophiles français avec une introduction de GEORGES VICAIRE (XXXI p., 72 p. de facsimile, Paris, 1890). Nos illustrations sont empruntées à un exemplaire de ce fac-similé grâce à l'amabilité de la Library of Congress de Washington.

G. S.

History of Science Society.—The Sixteenth Annual Meeting of the History of Science Society will be held in conjunction with the American Association for the Advancement of Science at Columbus, Ohio, December 27, 1939 to January 2, 1940. The Headquarters of the Society will be at the Chittenden Hotel.

Members wishing to appear on the program should communicate with Professor LOUIS C. KARPINSKI, Department of Mathematics, University of Michigan, Ann Arbor, Michigan.

Program History of Science Dinner Club (San Francisco, 1938-1939).

September 13, 1938. C. A. KOFOID. Dr. WILLIAM C. WELLS, a pioneer in the sciences.

October 11, 1938. R. H. LOWIE. The idea of evolution in ethnology.

November 8, 1938. F. O. KOENIG. II. The history of thermodynamics.

December 6, 1938. H. S. REED. The last fifty years in plant nutrition.

January 17, 1939. F. R. JOHNSON. Gresham College : The forerunner of The Royal Society.

February 14, 1939. EGON BRUNSWIK. Ontogenetic parallels to the development of scientific thinking.

March 14, 1939. H. B. TORREY. The doctrine of the seeds in the history of biology and medicine.

April 11, 1939. E. O. ESSIG. Highlights in the development of entomology.

May 2, 1939. C. D. LEAKE. The China Root by ANDREAS VESALIUS, 1546.

Reviews

Reinhold Strömberg.—*Theophrastea, Studien zur botanischen Begriffsbildung*, Göteborgs Kungl. Vetenskaps- och Vitterhets-Samhälles Handlingar, Femte Följden. Ser. A. Band 6. No: 4., Göteborg, 1937, Elanders Boktryckeri Aktiebolag. Pp. 234.

These studies, as is stated in the beginning (p. 5), are intended to show how Greek botany originated from Peripatetic philosophy, how THEOPHRASTUS established the system of a comparative morphology of plants, or rather laid the foundations of botany as a science, and finally how he formulated the results of his inquiries. The last task is later on (p. 41) restricted to the interpretation of some Theophrastean terms such as roots, stems, bark, core, sap, veins.

STRÖMBERG first comments upon the history of Greek botany up to ARISTOTLE and THEOPHRASTUS (I, Ch. 1) and upon natural sciences in the Peripatos, especially ARISTOTLE's and THEOPHRASTUS' methodical principles (I, Ch. 2). What he says is such a short survey of these complicated problems (pp. 17-37) and so much a summary of earlier opinions that it can be regarded only as an introduction to the following study of the morphological terms previously mentioned. Their discussion is certainly the most important part of the book as it is the most extensive one [(pp. 38-179). Pp. 183-195 give additional semasiological material; pp. 199-234 contain a very detailed bibliography and helpful indices].

STRÖMBERG consciously approaches his subject from the point of view of a botanist as well as from the philological and historical point of view (p. 41). Extensive travels have made him familiar with the Mediterranean flora (p. 6); and his interpretation of the single terms by far surpasses that of his predecessors, even that of HINDENLANG (1). Whereas parallels are given by HINDENLANG only with the names of the authors, they are quoted by STRÖMBERG with exact references to the passage and careful analysis of the content. The literature before THEOPHRASTUS is fully reviewed; later literature is also dealt with (cf. pp. 61, 3; 89). Analogies from other sciences are extensively cited

(1) L. HINDENLANG, Sprachliche Untersuchungen zu THEOPHRASTS botanischen Schriften, Diss. Strassburg, XIV, 1910. Cf. STRÖMBERG's general criticism of this dissertation, p. 39, 4.

and modern scientific writings concerning the subject are taken into consideration.

It is impossible to survey here the interesting details set forth by STRÖMBERG in his interpretation of the various concepts; I must limit myself to the discussion of a few more general questions. THEOPHRASTUS' significance as the creator of new terms is very cautiously estimated by STRÖMBERG (pp. 161 ff., esp. 164 ff.; 179); he is, quite rightly, I think, much more reserved in his judgment than HINDENLANG. It is especially the morphological terminology in which THEOPHRASTUS is recognized as original (pp. 89; 92 ff.; cf. 104-105; 111; 113). STRÖMBERG's rejection of the Theophrastean origin of terms is in most cases convincing; but his claims for Theophrastean coinages may sometimes be contested. One can, for instance, hardly conclude from the use of *ὥσπερ* that the following metaphor was first used by THEOPHRASTUS (pp. 132 ff.; 74, 1). Nor is it probable to assume that *μονόρριζος* is a Theophrastean word on the ground that plants with one root are rare and the occurrence of such a term before THEOPHRASTUS is therefore unlikely (pp. 63; 92). In general the problem is a very difficult one. Hardly any earlier botanical material has survived (p. 25). All conclusions have to be based mainly on THEOPHRASTUS' own works. Under these circumstances negative statements will always be more certain than positive conclusions.

STRÖMBERG characterizes the Theophrastean terms in general as types which he takes to be " relative concepts with solid center without sharp limits " (" relative Begriffe mit einem festen Kern ohne scharfe Grenzen," p. 151). THEOPHRASTUS more than anybody else favors such typological procedure (*ὡς τύπῳ εἰπεῖν* pp. 31; 154; 152) on account of his cautiousness as an investigator (2) (p. 80) and because of his belief that in botany exact knowledge cannot be attained, for natural objects, and especially plants, are too manifold and divergent (pp. 31; 151). With these assumptions I cannot agree. STRÖMBERG's definition of types is not very clear; he seems to mean, and this would be correct, that the *τύποι* give a kind of generalizing characterization of the data (cf. p. 31). Yet such an outline description is to be found not only in THEOPHRASTUS,

(2) Cf. also G. SENN, Die Entwicklung der biologischen Forschungsmethode in der Antike und ihre grundsätzliche Förderung durch THEOPHRAST von Eresos (*Veröffentlichungen der Schweizerischen Gesellschaft für Geschichte der Medizin und der Naturwissenschaften*, VIII, 1933, p. 115): " So gibt THEOPHRAST zwar wohldefinierte Einteilungen, schwächt aber das Starr-Systematische, das er verwirft, durch die Erklärung ab, dass seine Definitionen nur im Grossen und Ganzen gelten, und dass man sie nicht allzustreng anwenden dürfe. Das ermöglicht ihm, den vielen Übergängen Rechnung zu tragen, welche in der Welt der Organismen nun einmal bestehen."

but also in ARISTOTLE, who, contrary to STRÖMBERG's opinion (l.c.), employs it to the exclusion of any other in the *Topics* (101 a 18 ff.), the *Ethics* (1094 b 11 ff. ; cf. 1098 a 27 ; 1179 a 33), and the *Politics* (1341 b 31). The procedure therefore is independent of the subject matter, it is not true that its adoption indicates the impossibility of gaining more exact information. In his *Politics* ARISTOTLE leaves the details to those concerned with them and is satisfied with some general remarks (1341 b 31); in his *Zoology*, after having discussed the subject according to types (487 a 12), he later treats it in more detail (cf. also 491 a 7). The typological procedure then means only that in the present inquiry the subject is to be studied under one of its possible aspects, namely that of its general characteristics ; individual features are not sought for, regardless of the question whether the data allow logical or mathematical accuracy or exactness.

As far as the content is concerned STRÖMBERG describes the Theophrastean types as morphological, biological, and oecological, concrete groupings based on logically established similarities (p. 43). He rates the importance of THEOPHRASTUS' geographical interests lower than is usually done in accordance with BRETZL's results (3). How far this is justified I cannot decide. Whereas BRETZL bases his argument mostly on the content of the fourth book of THEOPHRASTUS' *Historia Plantarum* (4), STRÖMBERG founds his view chiefly on the first three books of THEOPHRASTUS. He himself admits, however, that THEOPHRASTUS was equally far removed from deductive and inductive philosophy (p. 110) ; and the natural system of plants which he ascribes to THEOPHRASTUS (5) also indicates that THEOPHRASTUS' studies are not motivated only by logical principles. Yet this important question can be answered not by an analysis of words or of parts of the Theophrastean work, but only by a careful and unbiased interpretation of the book as a whole.

The Johns Hopkins University. LUDWIG EDELSTEIN.

(3) Cf. H. BRETZL, Botanische Forschungen des Alexanderzuges, Leipzig, 1903. Cf. O. REGENBOGEN, *Hermes*, 69, 1934, p. 88, 1 : " Das moderne Missverständnis BRETZLS, THEOPHRAST wolle Pflanzengeographie geben..."

(4) So much seems certain although BRETZL goes so far as to call THEOPHRASTUS' whole book a " Pflanzengeographie " (cf. p. 42). This exaggeration of BRETZL's is criticized by STRÖMBERG with good reasons (*l. c.*).

(5) Such a natural system of plants has also been acknowledged by BRETZL (p. 9) and has not been overlooked as STRÖMBERG says (p. 33). About the concurrence of THEOPHRASTUS and ARISTOTLE in establishing such natural systems cf. STRÖMBERG, p. 29, 1 ; the Theophrastean is discussed more in detail, pp. 155 ff.

Abram Barnett Langdale.—PHINEAS FLETCHER, *man of letters, science, and divinity.* VIII+230 p. Columbia University Press, New York, 1937. ($ 3.00).

This Elizabethan poet (1582-1650) may have known both WILLIAM HARVEY and FRANCIS BACON. His claim to consideration in the history of science rests upon his poem, *The Purple Island, or the Isle of Man*, (1633), a 17th century poetical conception of the anatomy of the human body, notable for its ring of modernity in a time of change. He was of a Yorkshire family of marked intellectual ability, exhibited in their poetry, diplomacy, and scholarship. It included eight members of the faculty at Cambridge University. It was marked by a Viking-like zest for travel and change. The clerical career of PHINEAS was one of change and turmoil after his graduation from King's College, Cambridge.

The author of this new survey of the life of this minor poet entitles his closing chapter, " The magnificent enthusiasm," and devotes it to a critical search for the sources of PHINEAS FLETCHER's anatomical knowledge displayed in his *The Purple Island.* To this end he has surveyed the status of medical instruction in Cambridge at the time, the anatomical literature then available, and the internal evidence in the poem. The courses in anatomy and physiology in Cambridge belonged to the school of medicine and were notoriously backward, unpopular, and meagre. The Queen's Reader in Physic, Sir WILLIAM WARD, was conservative and did not temper his erudition with dissection. Obviously the poet did not derive either information or interest in anatomy from the university. The anatomical classics then available were very definitely not utilized by the poet. His phraseology is not traceable in form or sequence to VESALIUS or to any of his well-known followers. There is some internal evidence that the author of *The Purple Island* was familiar with THOMAS VICARY's *A Profitable Treatise of the Anatomie of Man's Body* because of certain very definite similarities in phrasing. Thus VICARY says, " The bone is a consimile member,—colde and drye of complexion " and FLETCHER versifies " Bones are a similar part of the body, most dry, or cold," but the parts of the poem so related are few, and VICARY's student textbook which ran to ten editions kept to the highway of Galenic tradition and did not utilize the discoveries of the Renaissance.

Human dissection in England when this poem was written was restricted by royal edict to two " anatomies " annually of executed felons each by the Barber Surgeons Company and by the College of Physicians of London. While FLETCHER was composing his masterpiece he made only infrequent trips to London where he might have visited these public " anatomies." *The Purple Island* bears internal evidence of being the unified product of a personal experience and the sustained interest of the

author in human anatomy for which a few casual contacts with dissection could not suffice. It bears the indubitable imprint, disguised in poetic garb, of accurate observation of the dissected human body. It is set forth in the well-known sequence of parts of the body as followed in these public anatomies. Where then did PHINEAS FLETCHER derive this knowledge? Not from London and not from the medical school at Cambridge.

Our biographer has succeeded in ferreting out the fact that Gonville and Caius College, through the influence of JOHN CAIUS, " that splendid rebel, though considered a fool," had acquired in 1557 from Henry VIII the right to perform two dissections annually in its little anatomical theatre. This little college was devoted to premedical students and was located close to Kings where FLETCHER resided. It seems probable that the poet was indebted to these semiannual dissections conducted between 1600 and 1610, and that he profited by the anatomical knowledge of demonstrators, THOMAS GRIMSTON and JOHN GASTLYN, fellows of Caius. Throughout *The Purple Island* indications abound that the author's information came directly from the anatomical theater and personal observation of the dissection of the human body.

This presentation of human anatomy based upon direct observation by an Elizabethan author known only as a minor poet has hitherto escaped historians of this science, except for an anonymous note in the *British Medical Journal*, May 9, 1895, which treated it with amused contempt, and an article by A. T. POHLMAN in the *Johns Hopkins Hospital Bulletin*, vol. 18, 1907, who regarded it as a bibliophile's rarity and without specification stated that its author had conned some standard text such as GALEN. FLETCHER's presentation was, it is true, unscientific, fanciful, allegorical, and half philosophical. Nevertheless, he was clear-headed, realistic, and scientific, wedded to the laboratory, to experiment, and to the renaissance of science at a time when and in a place where many, at least, of the professors, were deaf, dumb, and blind to the emerging new knowledge and its method. *The Purple Island* is a vindication of England's share in the growth of the scientific presentation of anatomy, of the scientific influence of JOHN CAIUS and his followers, and of PHINEAS FLETCHER's genius in the poetic interpretation of a repellent and tabooed but virile, emerging science of man.

CHARLES A. KOFOID.

Martha Ornstein (1878-1915).—*The Rôle of scientific societies in the seventeenth century*. XIV+308 pp. (The History of Medicine Series, no. 6) Chicago, Univ. of Chicago Press (1913, 1928), 1938 ($ 3.)

This well-known volume, which is " still the best account of a great

subject " (1), has been issued under the auspices of the Library of the New York Academy of Medicine. In its third edition again the text appears almost unaltered, a tribute to the authoress for her treatment of the subject that was originally printed as her Doctoral dissertation in 1913. Judging from citations and bibliographies found in other works which deal with the same period, one concludes that many scholars have found her volume helpful. Of the several works that have been published in recent years supplementing her materials, BROWN's is the more critical and least dependent upon hers. Dr. BROWN believes that Dr. ORNSTEIN's " is rather a study of the relative value to the advancement of science of the Academies and Universities, than a true history. She had a thesis to prove, not a story to tell. She paid too little attention to books, pamphlets and letters of her period " (2). So great was the acceptance of her book, however, that in Holland, England, and North America he had to argue the question of whether he had anything to add to hers. His own volume justifies his objections to her work; he has gone over those sources far more thoroughly and has paid greater attention to exact details. His is a masterful study of French scientific societies during that period. He wishes to show the rôle of extra-scientific factors in the development of scientific thought, that in the seventeenth century questions of theology and of political and literary prestige were seldom dissociated from abstract reasoning in problems of experimental science.

In their separate studies of scientific thought in seventeenth century England, G. N. CLARK, R. K. MERTON (3), and A. WOLF have indicated the complexity and dependence of science upon changes in outlook of social policy as well as upon important changes in technology. It was during that time that society, the official government, in the persons of ministers and kings as COLBERT and CHARLES II, first offered substantial support to the development of experimental science. What a change in public attitude, and what a galaxy of great names and works, from GALILEO to NEWTON! Any author writing a history of seventeenth century science would of necessity take up the works of the individual scientists. Thus, in the introductory part of her book, Dr. ORNSTEIN discourses upon HARVEY and BACON, VAN HELMONT, GUERICKE, and others.

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(1) As SARTON wrote in his review of the 2nd edition, *Isis* XII, 1928, pp. 154-6.

(2) BROWN, H. *Scientific Organizations in XVIIth century France.* (History of Science Society Publications, New Series Nr. V) Baltimore, WILLIAMS and WILKINS 1934, page x.

(3) For an excellent review of sociological aspects of the problem, see MERTON, R. K. *Science, Technology and Society in Seventeenth Century England*, in *Osiris*, vol. IV, Pt. 2 (1938).

The second part of the volume concerns the Learned Societies, the Scientific Academies in particular. She arranges the subject as to geography and chronology, discussing first those in Italy, then the Royal Society of London, and the Académie (royale) des Sciences of Paris. Finally she brings together materials on the several German scientific societies, preeminent among which was the Prussian, established at the end of the century, largely through the efforts of LEIBNIZ. BROWN's description of the Scientific journals in France is far more adequate, while she has omitted a number of German and English publications. The last part of her volume takes up the relationship between the Universities and the Scientific Societies. With the exception of the medical faculties, she concludes that Universities practically ignored the natural sciences, possessed no technical equipment nor provided suitable lectures. Evidence recently brought to light by GUNTHER (4) contradicts her more extreme statements (5).

One would conclude from her descriptions that only the Scientific Societies and the individuals who composed them were responsible for the extraordinary advances in seventeenth century science; though they were extremely important and most effective as centers for organizing scientific knowledge at that time, great advances were made, in each of the sciences, often apart from the work of the societies. A brief section on the relationship between the Scientific and the Learned Societies, and on the Scientific and other more specialized scientific societies (such as the relations between the Royal Society and the Royal College of Physicians or with the agricultural societies) and further mention of provincial organizations of similar character to the national organizations, would have been worthwhile. Her omissions are compensated by an excellent bibliography and index. Her style is clear and factual, free from a mystical interpretation of the reasons for societies' formations, for she shows how the societies developed largely through activities of individual scientists and patrons. Dr. ORNSTEIN suggests what was to follow : the founding of many more Scientific Societies in the next century. The extent of the seventeenth century Societies and their tremendous significance can be better evaluated when one looks at their later position. The eighteenth century, in science, was a fruition and culmination of the seventeenth which had developed high standa ds of observation and experimental skill, and the rôle of its Scientific Societies should contribute much to the understanding of the period before and after.

Cambridge, Mass., 1938. ALBERT ROBIN GOLDSMITH.

(4) GUNTHER, R. T. *Early Science in Cambridge*, Oxford, 1937.

(5) See also the discussion in D'IRSAY, S. *Histoire des Universités...* Paris, A PICARD, 1935, II, ch. XV-XVIII.

Observationes anatomicae selectiores, Amstelodamensium. 1667-1673.—Edited with an introduction by F. J. COLE, F.R.S. University of Reading, England 1938. Limited edition of 100 copies, XI+45+53 pages, index, frontispiece and 13 illustrations. Price, one guinea.

Perhaps the most characteristic feature of the organization and growth of biological research in the latter half of the seventeenth century, was the establishment, throughout Europe, of scientific societies or academies independent of the universities. Characteristic too, of this period, was the patronage of princes and nobility, whose interest, though as often as not purely vicarious, nevertheless did much to enhance the social reputation of science and materially further its aims. These societies initiated a rich and fertile movement and their publications are of the greatest importance for the history of biology. These publications have become increasingly rare and to Professor COLE we are indebted for rescuing one of these documents heretofore almost unknown. This exceedingly rare work, the " Observationes Anatomicae " of the " Private College " of Amsterdam he has made more generally available in the form of an exquisite reprint in which " the text has been faithfully reproduced line for line and page for page, *all grammatical, typographical and engraver's errors being carefully followed*, so that the reprint can be quoted with confidence as if it were the original work itself."

From internal evidence it would appear that the " Collegium Privatum " of Amsterdam was founded early in 1664, some two years after the Royal Society of London, and its activities continued sporadically until the year 1672. The publications of the society, in the form of two small tracts dedicated to its members, were privately issued in 1667 and 1673 at Amsterdam ; the last of these when, with a diminishing roster of members, the society was apparently about to dissolve, is amusingly introduced with a quotation from JULIAN " Etsi alterum pedem in sepulchro haberem, adhuc addiscere quaedam vellem."

The founder of the society was GERARD L. BLASIUS or BLAES (ob. 1692), whose important systematic treatise, the " Anatome Animalium " is well known. " Indeed " says Professor COLE in his critical introduction to this re-issue, " if it were not for the fact that the ' Amsterdamians ' were freely quoted in BLASIUS' ' Anatome Animalium ' of 1681, their work would be completely unknown, and, as it is, no modern writer on the history of biology seems to be familiar with their labours." Numbered among the ten initial members are the familiar names of SWAMMERDAM and MATHEW SLADE.

The tracts of the society consist of a number of isolated observations on the anatomy of various vertebrates and on the digestive glands of

fishes in particular; each observation being recorded in the tersest of style and many illustrated. Of their methods the most important is their introduction of mercury injections. Those familiar with Professor COLE's contributions on this subject will appreciate his regret that in this first description of the technique they should tell us so little.

All students of the history of biology will be grateful to Professor COLE for calling to their attention and making accessible this attractive and important work of a society which produced "the first *extended* work on Comparative Anatomy after SEVERINI."

Special mention should be made of the excellence of the typography and of the wood engravings, and the Department of Fine Art of the University of Reading which printed the work is to be congratulated on its beautiful production.

JOHN B. DE C. M. SAUNDERS.

Carl Van Doren.—BENJAMIN FRANKLIN (1706-1790). XIX+845 p., portraits. New York, Viking Press, 1938. ($3.75)

This latest addition to the literature on FRANKLIN is of interest to the readers of *Isis* in that it forms a striking example of the need for competent studies in the history of science. For Mr. VAN DOREN's book—the result of many years of research—is hopelessly inadequate, and by that inadequacy misleading, in the sections devoted to FRANKLIN's scientific work. And it could not have been otherwise; unless, of course, Mr. VAN DOREN had chosen to write the book in close collaboration with a professional historian of science. There are many books on FRANKLIN and although these are written from many points of view, there is no work that deals thoroughly with FRANKLIN the scientist (1). Not only is there no single work of this kind, but there is no group of smaller works which, taken together, would afford the general historian a means of evaluating FRANKLIN's scientific achievements and his position in the history of science.

The importance attached by Mr. VAN DOREN to the scientific side of FRANKLIN is witnessed by the amount of space given to his scientific work. Indeed, it could hardly have been otherwise, for much of FRANKLIN's political success on the continent was due to the reputation he had established as a scientist. The extent of this reputation may be seen in such simple facts as that he was a member of just about every

(1) Curiously enough, although there is no such work as this, there are listed in Mr. VAN DOREN's bibliography two works dealing with Franklin and medicine —THEODORE DILLER: FRANKLIN's *contributions to medicine*, Brooklyn, 1912; WILLIAM PEPPER: *The medical side of* BENJAMIN FRANKLIN, Philadelphia, 1911.

continental scientific society, that he was awarded the COPLEY gold medal of the Royal Society " on account of his curious experiments and observations on electricity," and that his book of letters—*Experiments and Observations on Electricity*—went through numerous editions in English as well as in French and German translation.

His most important work was done in electricity. In this field, he was at his best, for here his technical ability and ingenuity at devising experiments more than compensated for his almost complete ignorance of mathematics. His " single-fluid " theory of electricity successfully displaced the " two-fluid " theory of DU FAY ; his experiments established the identity of lightning and electricity (a fact only guessed at before) ; the experiments with different kinds of rods for drawing the " electric fire " led to the invention of lightning rods. His mark remains upon science in that he " appears to have been the first to use, at least in print in English, these electrical terms : armature, battery, brush,..., condense, conductor,..., minus (negative or negatively), non-conducting, non-electric, plus (positive or positively)..."

Mr. VAN DOREN's method in dealing with FRANKLIN's science is, largely, to let FRANKLIN speak for himself. Now to quote extensively is, in this instance, no sin at all, for FRANKLIN was certainly a master of prose style. But when Mr. VAN DOREN adds nothing to the quotations, or merely adds some narrative, the result is usually misleading, as may be seen from the following examples.

Pages 143-146 deal with FRANKLIN's magic squares, two of which are reproduced in the text. These four pages are made up entirely of quotations from FRANKLIN concerning these squares, plus Mr. VAN DOREN's narration of the time at which they were made. The quotations end with FRANKLIN's statement : " I make no question but you will readily allow this square of 16 to be the most magically magical of any magic square ever made by any magician." Was this said with the tongue in the cheek or was FRANKLIN speaking in all seriousness ? Or, were these magic squares in advance of those made previously or were they not ? Did FRANKLIN ever concern himself with general problems related to these squares or were they to him just so many puzzles ? Mr. VAN DOREN offers no comment of any sort : we simply are told nothing on any of these points. Of course, the historian of mathematics will realize that these squares of FRANKLIN are of no importance in the development of mathematics (that more " magical " ones had been made much earlier). He will also recognize that constructing such squares is no indication of mathematical ability on FRANKLIN's part. But what of the plain reader ?

Or, consider the discussion on pages 178-179 of the ideas held by

FRANKLIN on the nature of light (to be found in a letter to CADWALLADER COLDEN of 1752). Here again Mr. VAN DOREN merely quotes extracts from this letter in which FRANKLIN expressed dissatisfaction with the corpuscular theory of light and gave out some vague notions of a wave theory, arguing from the analogy with sound. The only thing of his own that Mr. VAN DOREN adds is this : " Whether he knew that HUYGENS had already propounded the wave theory of light is not clear, but FRANKLIN did know that the corpuscular theory, with its flying particles, was orthodox. Heretically he embraced the theory of the future." What is important in this case is not whether FRANKLIN knew or did not know the writings of HUYGENS, any more than it is important to know whether or not he knew the vague gropings at a wave theory of light contained in the writings of HOOKE, say, or MALEBRANCHE. What is important is that FRANKLIN was, with the exception of EULER (2), the major scientist of the eighteenth century to advocate a wave theory. And yet this is interesting only as a historical curiosity, for FRANKLIN (like EULER) advanced merely theoretical considerations of a philosophical nature and convinced no one. HUYGENS worked out a complete theory ; FRANKLIN did nothing of the sort. Thus, since his ideas are more primitive than those of HOOKE, far indeed from those of the nineteenth century (YOUNG, FRESNEL, etc.), to say that FRANKLIN heretically embraced the future seems mere uninformed enthusiasm.

The section on electricity is the best of the scientific sections, at least in the descriptive sense. This is probably due to the fact that Mr. VAN DOREN had at his disposal PRIESTLEY's *The history and present state of electricity* which has an especially full account of FRANKLIN ; since FRANKLIN was PRIESTLEY's friend and advisor and the standard authority of the time. Yet, even in this portion of the book there are slips. It is hard to understand why, on page 156, Mr. VAN DOREN states with authority that " not until January 1746 had PIETER VAN MUSSCHENBROEK at Leyden discovered the electric bottle later known as the Leyden jar, the simplest and for years the only known condenser, which was the basis of early electrical research." It is unfortunate that in this particular instance Mr. VAN DOREN, in an attempt to be scholarly, fixes the time exactly by month and date, for any history of physics (even an elementary one like that of CAJORI or HOPPE) would have let him know that the same discovery had been made a year earlier by VON KLEIST, although VAN MUSSCHENBROEK's discovery was probably made independently. It is unfortunate, too, that Mr. VAN DOREN ignores, or is not aware of the fact that FRANKLIN seems to have been the first person

(2) *Lettres à une princesse d'Allemagne* and *Nova theoria lucis et colorum.*

to have experimentally induced magnetism by electricity. In a letter to CADWALLADER COLDEN of 1751, he writes : "I have melted brass pins and steel needles, inverted the poles of the magnetic needle, given a magnetism and polarity to needles that had none, and fired dry gunpowder by the electric spark" (3).

This kind of inadequacy on the part of Mr. VAN DOREN is all the more to be regretted because, insofar as the present reviewer is in a position to judge, his biography is the most complete that has as yet appeared. It is well written and gives a clear picture of the many-sidedness of FRANKLIN. It is well documented, completely indexed, handsomely printed with attractive illustrations, and reasonably priced. Since, in spite of its defects, it remains the best work on FRANKLIN that we have, how unfortunate that the best is none too good !

I BERNARD COHEN.

(Carnegie Institution)

Edward Cressy.—*A hundred years of mechanical Engineering.* The MACMILLAN CO., New York, 1937.

Mr. CRESSY has produced an interesting descriptive book of 340 pages, with 157 line drawings and process cuts by way of illustrations. The preface of the book refers to it as an outline account of development in the more important departments of mechanical engineering, and in the application of mechanical engineering to a number of other industries and public services during the last hundred years. It also is indicated that the author intended the compilation to interest young men who are in touch with engineering affairs or are interested to learn something of the history of mechanical engineering. This is all laudable.

The publication has been given a name which lacks in accuracy, since the book is substantially limited to the description of machinery and its development or application in certain important fields during 100 years. Indeed, in that aspect it does more and treats of developments occurring over a period of 200 years, since the opening chapter begins with work of NEWCOMEN (1705) and work of WATT (1765), and some of the recent

(3) *The writings of* BENJAMIN FRANKLIN (ed. by A. H. SMYTH), New York, 1907, vol. III, p. 34. This letter is also to be found in the *Experiments and observations on electricity*—on p. 93 of the London edition of 1769. In a later letter (1773) FRANKLIN states his views on electricity and magnetism, saying : "as to magnetism, which seems produced by electricity, my real opinion is, that these two powers of nature have no affinity to each other,... that an electric shock passing through a needle... renders it... a permanent magnet... not by imparting magnetism to it, but by allowing its proper magnetic fluid to put itself into motion." *The writings etc.* vol. VI, pp. 23-26.

developments described in the latter part of the book are referred to the years from 1933 to 1936.

Divided into three parts, entitled Production and Distribution of Power, Materials and Processes, and Applications of Power, the book covers its subject in 18 chapters of well-illustrated descriptive matter, and ends with a 12-page Chapter of Retrospect and Summary. As a description of numerous types of machines and some of their applications, the book fulfills the author's expressed purpose, but its failure to outline the development of scientific designing in mechanical engineering, adequately outline the development of mass-production as now practiced (as in the automotive industry), to outline the influence of improved materials on the designer's work, or to outline the tremendous changes which have occurred during recent years in the mechanical engineering of great power stations and on ship board, and to outline other notable factors which have made mechanical engineering of such great influence in present-day life, robs the book of the right to be called " A History of Mechanical Engineering."

There appears to be no reference to the Newcomen Society which was founded shortly after the World War to give emphasis to the history of engineering and which has been notably active in England, its native country, and from the impulse of which have come a good many historical sketches of engineering affairs, some of which have related to mechanical engineering.

(*Cambridge, Mass.*) DUGALD C. JACKSON.

Le Prince Omar Toussoun (1).—*Les missions scientifiques à l'époque de Muḥammad ʿAlî, de ʿAbbâs al-Awwal et de Saʿîd* (638 p. en arabe). Imprimerie ṢALÂḤUDDÎN. Alexandrie, 1353—1934.

Je m'intéresse depuis longtemps à l'histoire de la renaissance arabe, d'abord parce qu'il n'y a rien de plus impressionnant que l'éveil intellectuel d'un peuple, ensuite parce que cela m'aide à comprendre le phénomène inverse qui se produisit au moyen âge. En effet si l'on veut se rendre compte des traditions médiévales il faut étudier par quels moyens la science grecque d'abord, puis la science arabe ont été transmises à l'occident. Pour cela il faut avant tout énumérer les livres qui ont été traduits et expliquer qui les a traduits, à quelles dates et dans quelles circonstances. Aujourd'hui, quand on étudie le réveil de l'orient, les mêmes problèmes se posent en sens inverse. C'est pourquoi j'ai été heureux de publier

(1) C'est ainsi que l'auteur écrit son nom dans ses propres publications occidentales pour se conformer à la prononciation française. Dans ce qui suit je l'écrirai à la manière d'*Isis*, ʿUMAR ṬÛSÛN.

dans *Isis* les belles études du Dr. LUTFI M. SA'DI sur la renaissance scientifique de Beirût (2). Toutefois cette renaissance avait été précédée par une autre due au fondateur de l'Égypte moderne, le grand vice-roi MUḤAMMAD 'ALÎ qui régna de 1805 à 1848 et fut pour l'Égypte ce que PIERRE LE GRAND avait été un siècle plus tôt pour la Russie. L'Égypte avait été réveillée très brutalement en 1798-99 par BONAPARTE (3) qui lui apporta à la fois toutes les misères de la guerre et quelques bienfaits de la civilisation. Ce fut un des grands mérites de MUḤAMMAD 'ALÎ AL-KABÎR de continuer l'œuvre civilisatrice que les Français avaient amorcée. Il le fit d'ailleurs avec leur concours, ses principaux collaborateurs étant EDME FRANÇOIS JOMARD (1777-1862), ancien membre de l'expédition et de l'Institut d'Égypte, qui organisa la géodésie du pays et plus tard l'éducation en France de ses fils les plus doués, et ANTOINE BARTHÉLEMY CLOT, mieux connu en français et en arabe sous le nom de CLOT bey (1793-1868), qui organisa l'enseignement médical et l'hygiène publique. Le meilleur moyen d'évaluer l'œuvre accomplie par MUḤAMMAD 'ALÎ c'est encore de lire l'*Aperçu général sur l'Égypte* publié par CLOT bey vers la fin de son règne (2 vols., Paris 1840) (4). Soit dit en passant ce livre permet aussi de mesurer non seulement les progrès immenses qui ont été faits depuis lors en Égypte sur la base modeste mais solide établie par CLOT bey, mais aussi les progrès médicaux du monde entier. La description que nous fait CLOT des maladies de l'Égypte est fort curieuse. A cette époque—il y a moins d'un siècle—on ne connaissait l'étiologie *d'aucune* maladie tropicale, et il était donc impossible d'instituer une thérapeutique rationelle.

L'amîr 'UMAR ṬÛSÛN, qui est un descendant direct de MUḤAMMAD 'ALÎ, vient de nous donner un livre admirablement documenté sur cette renaissance intellectuelle. J'ignorais son existence, et sans doute l'ignorerais-je encore si mon ami le Dr. MAX MEYERHOF n'avait eu la bonté de m'en envoyer un exemplaire. L'ouvrage nous décrit en grand détail les missions d'élèves envoyées en Europe pour en ramener les sciences et les arts d'occident. Cette description est faite sur documents d'archives qui sont ici publiés ou résumés ; une bonne part des originaux sont en langue turque ou française, mais le tout est donné ou décrit

(2) Al-ḥakîm CORNELIUS VAN ALEN VAN DYCK, 1818-95 (*Isis* 27, 20-45, 1 pl., 12 fig., 1937); The life and works of GEORGE EDWARD POST, 1838-1909 (*Isis* 28, 385-417, 1 pl., 10 fig., 1938).

(3) FRANÇOIS CHARLES-ROUX : BONAPARTE, gouverneur d'Égypte (Paris, 1935; *Isis* 26, 465-70).

(4) Le portrait de MUḤAMMAD 'ALÎ que nous publions ici est emprunté à cet ouvrage. Comme CLOT bey connaissait très bien le vice-roi, il est probable que ce portrait a été bien choisi.

en arabe. La majeure partie du livre est consacrée bien entendu à MUḤAMMAD ʿALÎ (414 p.), mais l'auteur nous montre que l'œuvre accomplie dans la même direction par deux de ses successeurs fut loin d'être négligeable.

D'après le résumé donné par l'auteur (p. 576), MUḤAMMAD ʿALÎ envoya huit missions en Europe (la plupart en France, mais d'autres en Italie, en Angleterre et en Autriche), comptant non moins de 339 élèves ; ʿABBÂS I (1848-54) envoya 48 élèves ; SAʿÎD pasha (1854-63), en envoya aussi 48. N'oubliez pas que MUḤAMMAD ʿALÎ pacha a régné pendant 43 ans tandis que ʿABBÂS et SAʿÎD ne sont restés que 6 et 9 ans sur le

trône. Pendant un demi siècle (car les premiers élèves ne partirent qu'en 1813) 435 jeunes Égyptiens furent envoyés en Europe, la plus grande partie en France. L'auteur nous donne beaucoup de détails sur ces missions et ajoute de courtes biographies de 334 de ces élèves qui furent les vrais pionniers de l'Égypte moderne et dont plusieurs sont devenus de grands fonctionnaires, des professeurs, des médecins, etc. et dont plusieurs aussi ont obtenu les dignités de pacha ou de bey (5).

Il est clair que cet ouvrage sera fort précieux pour les enfants de l'Égypte moderne; il constitue une sorte de livre d'or de l'aristocratie scientifique, et beaucoup de nos amis d'Egypte pourront s'en servir pour prouver les titres de gloire de leur famille.

L'auteur indique le but de chacune des missions, le programme imposé aux élèves, les conditions d'admission (l'une d'elles était d'avoir les yeux sains), le montant exact de leurs bourses d'études ; il nous donne beaucoup de détails sur leur vie à l'étranger, sur l'organisation de leurs études et des examens, il nous dit même quels livres leur furent donnés en prix ! A propos d'un élève qui mourut en France en 1833 il nous fait connaître le coût des funérailles et de sa tombe. Il traduit un discours que fit aux boursiers égyptiens le baron DUPUYTREN.

La majorité des élèves faisaient leur apprentissage militaire ou naval, d'autres étudiaient le droit et l'administration, la médecine ou la pharmacie, l'agriculture, les sciences naturelles, la chimie, la minéralogie et l'industrie minière, les arts mécaniques ; d'autres encore apprenaient divers arts et métiers. Par exemple 21 charpentiers furent envoyés en Angleterre pour s'initier à la construction des navires. Il est clair que le but poursuivi était essentiellement utilitaire, comme de juste d'ailleurs. Aucun boursier n'est cité comme mathématicien, et je n'ai noté que trois astronomes (sous 'ABBÂS).

La plupart de ces très nombreuses biographies sont naturellement courtes, mais quelques unes sont plus étendues, par exemple celles de 'ALÎ MUBÂRAK pasha (1824-93) dont le prince 'UMAR nous fait un très grand éloge (p. 244) et de AḤMAD NADÂ bey (d. 1877). D'autres personnalités sont citées très fréquemment, par exemple le shaykh RIFÂ'A bey AL-ṬAHṬAWÎ (1802-73), qui fut le principal interprète et traducteur de CLOT bey et à qui on doit un bon nombre de traductions. SARKÎS lui attribue 34 ouvrages dans sa biliographie arabe, ce qui est déjà bien, mais MAURICE CHEMOUL nous dit (E I 3, 1155-6, 1936) que le shaykh RIFÂ'A et ses élèves ont traduit en arabe et en turc près de 2,000 ouvrages, et cela me paraît un peu fort.

(5) Beaucoup d'Égyptiens continuent à étudier en Europe ou aux États Unis, à titre privé ou comme boursiers du gouvernement. Voir à ce sujet une lettre de FIKRY ABĀẒA dans le *Muṣawwar* (Le Caire, 30 sept. 1938).

Comme je l'ai dit au début de ce compte-rendu, ce sont les traductions qui m'intéressent le plus parce que celles-ci nous permettent de savoir exactement quelles connaissances furent transmises à un moment déterminé. A ce point de vue, l'ouvrage du prince ʿUMAR, quoique si riche à d'autres égards, m'a désappointé. J'espérais y trouver une liste complète des auteurs et des ouvrages traduits, et cette liste ne s'y trouve pas, quoi qu'on pourrait peut-être l'en extraire. Il se peut qu'il nous la donne dans son prochain ouvrage, déjà annoncé, qui contiendra aussi les portraits qu'il n'a pas été possible d'ajouter à celui-ci.

L'ouvrage se lit fort aisément car l'auteur l'a écrit dans un style simple pareil à celui de ses confrères d'occident, et a évité l'euphuïsme, la rhétorique entortillée, et l'emberlificotage qui rendent si pénible la lecture de beaucoup d'ouvrages arabes et nous empêchent parfois de les comprendre. Le raison en est fort claire ; le Prince ʿUMAR écrit, non pas pour le plaisir d'écrire, mais parce qu'il a des choses importantes à nous dire. Son livre est comme un navire qui va droit à sa destination parce qu'il est bien chargé et bien conduit, tandis que les livres de ces rhétoriciens ignares sont comme des bateaux ivres ; ils ne gouvernent pas parce qu'ils sont trop vides.

Il y a un bon index, mais je pense qu'il vaudrait mieux indexer les noms européens séparément, parce qu'on ne les reconnait pas assez vite sous leur forme arabe. L'ouvrage est très bien imprimé, sans trop de coquilles, mais il serait plus lisible encore si les documents étaient détachés du texte par l'emploi de caractères différents. Ces critiques, les seules que je puisse faire, sont vraiment sans gravité. L'ouvrage est une contribution de tout premier ordre à la connaissance de l'Égypte moderne. La modestie de l'auteur, et sa gratitude pour les vrais pionniers du progrès de sa patrie, me paraissent d'aussi bon aloi que son excellente documentation.

GEORGE SARTON.

Georges Contenau.—*La Médecine en Assyrie et en Babylonie* IV+230 p., 60 figures and one map. Librairie MALOINE, Paris 1938.

Babylonian medicine has no equivalent to the Papyrus Edwin Smith, which presents a comprehensive picture of the medical art of the ancient Egyptians. And yet we do know that already as early as about 2000 B.C. the art of the physician flourished in Babylonia. The Code of HAMMURABI regulates by law the activities of the professional surgeon among those of the other artisans and craftsmen. The price of a successful operation is ten shekel in silver. The faulty operation, resulting in the death of the patient, has its penalty. The hands of the blundering, or mischievous, surgeon are to be cut off. The veterinarian, too, practiced

his profession, and his services had a fixed price, which, however, was paid only in the case that his remedies proved to be successful. If he failed and caused the death of the animal, he had to pay damages. From later documents we know that it was usual for the physician to be sworn in by the government; but, unfortunately, the contents of the oath have not been preserved.

Script and language of the medical documents are very archaic. The latter have been edited in the old Sumerian language and contain still a maximum of the ancient pictographic signs. This proves the high antiquity of the medical science. Characteristic is also the concise form of the Babylonian texts and their epigrammatic style. Apparently, they were intended to serve as short résumés only and as a kind of *memoria technica*. The main substance of the theory and practice of medicine must have been transmitted by word of mouth.

In the history of Babylonian medicine we may distinguish two phases : the medicine of the priest, based upon magic and religious beliefs and doctrines, and the medicine of the professional physician, exhibiting already the rudiments of sober observation, of an investigation into the nature of the disease and of a natural therapeutic treatment of the patient. But it is safe to say that the gist and bulk of the Babylonian medicine is sacerdotal and magic in its nature. The reviewer, as a student of Babylonian mathematics, was at first shocked by this relative backwardness and stagnancy of the medical system of the Babylonians. However, we must take in consideration the fact that in the cradle of its infancy medicine was still a part and parcel of the official religious system of the Babylonians. Hence the dead weight of irrational traditions and primordial magic by which their medicine is still loaded down. On the other hand, the mathematical disciplines are entirely free from this burden of inheritance and from the encumbrance of the dead past. Babylonian medicine we see growing like a living organism, carrying along with it the embryonic vestiges of a remote past into the phases of a later development. In Babylonian mathematics we are confronted with a new creation, with an artificial product of human reason, skill and technique. We may fitly compare it with the sudden appearance of Greek Science, and call it the Babylonian Miracle.

Quite in keeping with the character of Babylonian medicine, the greater part of CONTENAU's work is devoted to the official medicine practiced by the priests and dominated by ancient traditions. Sickness is the indication of sin, it is the punishment for sin and shows the anger of God. The angry God afflicts with sickness and heals, if properly appeased by the intervening priest. The latter, the original medicine man, is called *asu* or *iazu*, which means "the one who knows the water," and

" the oil ", not as a medicine but as a medium of divination, as a diagnosis by magic. It is the so-called *lecanomancy*.

Pretty soon, however, there emerges the dawn of a new medicine, based upon observation, experience and reason, which tries to fix the seat and the symptoms of the disease, to create a classification and nomenclature for the maladies, and to find out their natural causes and cures. There are long lists containing the old Sumerian names of the diseases and their translation into Assyrian language. In other documents the names are already accompanied by short and characteristic descriptions of the symptoms, thus guiding to a proper diagnosis of the illness. CONTENAU reproduces in particular the Babylonian medical prescriptions for the diseases of the stomach and of the respiratory organs and for the affections of the genito-urinary organs. Of great interest are the last paragraphs dealing with the possible relations between Babylonian medicine on one hand, and the medicine of the Egyptians, Greeks and Christian Syrians, on the other hand.

CONTENAU's book is not a learned book intended for the specialized historian of medicine alone, but it is a very readable one which will be enjoyed by the educated layman interested in the history and civilization of the ancient Orient. The lay reader will welcome the illuminating introduction on the general history of the country and the stimulating chapters dealing with such subjects as Medicine and Art, Medicine and Law, Medical Schools and Books, the Physician and Society, etc. The ethnologist will benefit by the abundant information about the primitive life and medicine of the Babylonians. Here is the place to remark that the present book is the second volume of a series called " *La Médecine à travers les Temps et l'Espace*," the first volume of which dealt with the medicine of the primitive peoples. CONTENAU did not encumber his work with long-winded polemical and learned notes. Only brief references to the sources are given in the notes. The serious student of the subject, however, will turn to his account the elaborate bibliography extending over twenty pages at the end of the book. All in all, it is a good, clear, highly instructive and interesting work, the usefulness of which is still further enhanced by an abundance of beautiful illustrations.

New York City. SOLOMON GANDZ.

Vincent F. Hopper.—*Medieval Number Symbolism.* XII + 241 pages. New York City, Columbia University Press, 1938. ($ 2.90).

It is rather hard to define symbolism, as it covers a great variety of different things. In general, a symbol is something visible used to represent the invisible, a concrete image representing the abstract idea. But in number symbolism, an abstract number is employed to recall

the memory of a concrete thing, of an emotional experience or sacred person. Human imagination likes to visualize the beauty and love of God in the picture of the Virgin. But in number symbolism, the trinity or some other holy number is used to symbolize the Deity or the Virgin. DANTE, in his *Vita Nuova*, believes to capture the reader's admiration for BEATRICE by describing her as a *Nine*.

In his study on medieval number symbolism, Dr. HOPPER desires to reveal how deeply rooted in medieval thought was the consciousness of numbers, not as mathematical conceptions, but as mystic realities, alive with memories, saturated with emotion and replete with sacredness and magic power. It is a study, not in history of mathematics, but in medieval literature, especially in DANTE, with its theological speculations. Some chapters, like that on Pythagorean number theory and on medieval number philosophy, contain also valuable information on the Pythagorean theories and on the *Arithmetic* of NICOMACHUS OF GERASA. The bulk of the book, however, is devoted to an investigation of number mysticism. It is the author's object in his present study " to explain the basis, meaning, purpose, extent and use of number symbolism in the Middle Ages—with the aim of producing a frame of reference for such isolated number symbols as might be encountered in medieval texts."

The reviewer would like to distinguish two kinds of symbolism, the rational and the mystic symbolism. Rational symbolism creates tools for our mind and visible bodies for our hidden thoughts. It is progressive, it advances science and civilization, it strengthens and develops the human mind. In regard to that kind of symbolism it was wisely said, by GEORGE SARTON, that poor symbolism is better than no symbolism at all. Because the poor symbols are like the poor primitive tools which develop later into the improved instruments and machines. On the other hand, mystic symbolism is a perversion and misusage of the idea of symbolism. It is a reversal to childish and primitive thinking, to the symbolism of decadent literature.

It is interesting to observe how powerful and all-embracing the mystic tendencies of mankind are. If they are given a free hand, nothing is safe from their encroaching influence. Even numbers, these most abstract and rational ideas of the most abstract and rational science, of mathematics, are forced into the service of mysticism, are presented as possessing occult powers and alluding to mystic ideas and persons. History of mankind is a history, not only of the forces of progression but also of those of retrogression. It must describe the unceasing struggle between the powers of light and darkness. In that sense periods and currents of mysticism should be fully investigated and described. But the true nature of these currents must be characterized, things must be called by

their true names. Otherwise, it will once be said of our decaying civilization, too, *Nomina vera rerum perdiderunt.*

SOLOMON GANDZ.

W. E. Van Wijk.—*Decimal tables for the reduction of Hindu dates from the data of the Sūrya-Siddhānta.* VII+33 p., folding tables, frontisp. The Hague, MARTINUS NIJHOFF, 1938. (4 guilders.)

More than a decade has elapsed since the publication of the following papers in *Acta Orientalia* : " On Hindu chronology " (1) by VAN WIJK; " The eras of the Indian Kharoṣṭhī inscriptions " (2) by STEN KONOW and VAN WIJK; " On dates in the Kaniṣka Era " (3) by VAN WIJK. The first of these studies, " On Hindu chronology," consisted of the following chapters : I. Decimal Tables for finding the mean anomaly of the sun and for calculating the equation of the centre of the sun according to the Sūrya-Siddhānta ; II. Decimal Tables for finding the mean anomaly and for calculating the equation of the centre of the moon according to the Sūrya-Siddhānta; III. Decimal Tables for finding the Julian date of the Saṃkrāntis and for finding the initial points of lunations according to the Sūrya-Siddhānta; IV. Decimal Tables for calculating the exact moments of beginning of mean and true tithis, karaṇas, nakṣatras and yogas, according to the Sūrya-Siddhānta; together with some miscellaneous notes on the subject of Hindu Chronology; V. Decimal Tables for calculating true local time, according to the Sūrya-Siddhānta.

This study, " On Hindu chronology," may be considered as the foundations on which the author has now erected his *Decimal tables for the reduction of Hindu dates*—and on which he intends to erect the remaining part of the structure, devoted to yogas, nakṣatras, Jovian cycles and the reduction to other Siddhāntas. The present book is, therefore, but the first half of a synthetic work based on the analytical studies published in *Acta Orientalia* between 1922 and 1926. The " reading matter " of the book consists of a Foreword (p. V), a list of Books and Articles Consulted (p. 1-2), an Explanation (p. 3-25), of twenty-eight Practical Exercises (p. 26; answers on p. 33), and of an Index and Glossary (p. 27-33). Considering the technical nature of the subject matter, the Explanation ought to be considered as a successful attempt to encourage the use of the new Tables by epigraphists, archaeologists, and philologists—who may have been unable to appreciate the analytical presentation in *Acta Orientalia.* Numerous numerical examples in the text of the

(1) 1, 206-23, 1922; 2, 55-62, 1923; 2, 235-49, 1923-24; 4, 55-80, 1925; 5, 1-27, 1926.

(2) 3, 52-91, 1924.

(3) 5, 168-70, 1926.

Explanation show both how the Tables ought to be used and how the computations ought to be arranged. The twenty-eight Practical Exercises ought to familiarize non-astronomical users of the Tables with the practical aspects of the reduction of Hindu dates. The Index and Glossary will be useful to astronomers interested in Hindu chronology. This reviewer suggests the following change in the wording of the last two lines of § 22 : " ...beginning less than $0.^d909$ after sunrise must end during the day following the next sunrise..." or " ...must end after the sunrise of the following day... "

The arrangement of the Tables on folding sheets seems to be very practical. The diagrams illustrating the Explanation are clear in spite of their small scale. From a purely typographical point of view, this book is a worthy companion volume to *De Gregoriaansche kalender* (1932) and to *Le nombre d'or* (1936); see *Isis* 28, 140-42; the three books are uniform in size, type, and general design; ALEXANDER STOLS, the Maastricht master printer, has produced another beautiful book; the framed numerical examples in the text are typographical masterpieces.

The frontispiece is a reproduction of a portrait, in oil, of JEAN BAPTISTE FRANÇOIS DE WARREN (JOHN WARREN), 1769-1830, the " founder of Hindu chronological research."

A. POGO.

Zaki Ali.—*Islam in the world.* XII+428 p. Lahore, Shaikh MUHAMMAD ASHRAF, Kashmiri Bazar, 1938.

This is a book of good will and should be read with good will and should not be exposed to small details of criticism. The author is a practicing physician and a devout Muslim of an old-fashioned type. He is not ashamed of his faith or of his Prophet or of his Sacred Book and believes that they can all face the modern world and have their place and part in it. His sympathies thus are with the Islam of Egypt and modern Arabia and not at all with the new Turkey. For him Islam is Arabian and the Arab race is the bearer of Islam.

But he fears that Europe does not know or understand the essential Islam of the Qur'an and MUHAMMAD and the old Muslim theology and Canon law and his first aim is to clear away the dangerous misunderstanding which he believes to exist in the West as regards Islam and the Muslims generally. How far this fear is justified, in its full extent, may be doubted, but any book that honestly sets itself, as this one plainly does, for enlightenment and reconciliation is to be welcomed. A second aim is to give an historical picture of the Muslim peoples in their revival and progress as at the present day and to demonstrate that they are in no sense a menace to the West but are rather an element working for

stability in the world situation and a driving spiritual force for real peace.

In accordance with those two objects the early chapters are given to very lucid statements on such subjects as the life and work of MUHAMMAD, the Prophet ; Islam as a religion and as a social order ; the Qur'an and Islamic law ; the Islamic state ; the Caliphate ; civilization as developed in Islam ; the spread of Islam ; development, corruption and reform in Islam ; the contacts, past and present, of Islam with the West. For Dr. ZAKI ALI has no question, and in this all who know the situation will agree, that the complex of Muslim peoples and states has now entered upon a new life, intellectual, religious and political. This is no Panislamic dream under the hegemony of the state and the leadership of a Caliph —although it is plain that he has yearnings toward the unity of primitive Islam—but rather a federation of Muslim states each working out its own destiny in the broad obedience of the Prophet and the Qur'an. So he gives in his second part a series of chapters to those states describing their recent history in this awakening. Much of the matter here is, of course, highly controversial and into controversy this review has no desire to enter. And all will agree that it is well to have, on the Muslim side, so calm, full and objective a statement for understanding and reconciliating as we have here.

DUNCAN B. MACDONALD.

Julius W. Friend & James Feibleman.—*What Science Really Means.* 211 pæg. London : GEORGE ALLEN & UNWIN Ltd., 1938, (7s. 6d.).

This interesting work is subtitled " An explanation of the history and empirical method of general science." Actually it is very much more than that. In addition to being what is stated in the subtitle, the work is substantially a broadside aimed both at the Positivism of the CARNAP school, the Positivist Operationalism of the BRIDGMAN school, and the Mentalist school of EDDINGTON and JEANS. The authors require no more than fifty thousand words to launch the attack and clean up. The book is very compactly written, and not a word is wasted; in fact, the economy of the authors is sometimes such that a great deal which should, we feel, have been said is left completely unsaid. Doubtless, such close writing is one of the benefits of collaboration. However this may be, it is hardly possible once one gets started to stop, so hot and furious is the pace of the authors, but it cannot be said, and this is a pity, that the experience is as exhilarating as it might have been, for the tightness and solemnity of the writing acts somewhat as a strain upon the reader in spite of the interest of the subject. But when all this has very ungraciously been said the book remains one to be read.

The authors feel very strongly that the tendency of modern scientists to

distrust reason and to rely almost exclusively upon what is considered to be the solid bedrock of fact, is an attitude based upon a grave misunderstanding, and one that is likely, if pursued, to do the development of science serious harm. The authors trace the development of the scientist's anti-metaphysical bias and their rejection of abstract thought in favour of facts and experiment from the Middle Ages to the present day, commencing their survey by way of preparation with scientific thought and empiricism in the Hellenic period. With great assiduity the authors set out to show that the scientist has never really abandoned philosophy, since the empiricism upon which he has so prided himself, and which he has fondly believed to be free from philosophical bias, is, as the twentieth century has shown, deeply and indissolubly imbued with it. In elaborating this point the authors have performed a very real service, and if most young scientists, as well as their teachers, could be persuaded to read what the authors have to say in this connexion there can be little doubt that the nature of their scientific thinking would, at the very least, become somewhat clearer to them. " The fact of the manner " write the authors, " in which scientists have stumbled upon or deliberately reasoned their way to the truth must be distinguished from the ideal towards which they have aspired only by approximation," (p. 24); the ideal being a metaphysic-less empiricism.

Every well-informed scientist will agree that although some of the greatest discoveries of our age have been made by men who have never so much as given philosophy a thought, the processes which led them to these discoveries often involved a good deal of unrecognised, or at least unacknowledged, abstract thought. The authors consider that it would be better if this abstract thought were clearly expressed and understood by the scientist; it is the general nature of this process of abstract thinking which the scientist invariably uses but rarely explicitly recognizes in his work that the authors attempt to formulate. In this part of their work the reviewer feels that the authors have not been entirely successful, for their formulation is for the most part not put in constructive but in destructive terms. Nevertheless their destructive formulation may succeed in doing for scientific method what the late F. C. S. SCHILLER's *Formal Logic* did for logic, in a very similar but exhaustively more clear analysis. The present work together with one such as COHEN and NAGEL's *Introduction to Logic and Scientific Method* should succeed in doing what the authors have hoped to achieve alone. As a very effective criticism of scientific method and of the schools named at the beginning of this review the book is excellent; but it is quite impossible for the present reviewer to see the cogency of the authors objection to the notion that the only true philosophy is the philosophy of scientific method.

An unphilosophical scientific method is an absurdity, but so is an unscientific philosophy. Neither of these two facts is commonly recognized. The authors would have us believe that a science of the sciences is possible. "What is required" they write " is a synthesis which will be capable of embracing all the sciences already known and those to be known under one grand science. Such a general science of sciences would have to show each science as a special case of its universal laws... " (p. 208). What, if not the philosophy of scientific method, is this? It will be recalled that the Greeks believed that philosophy was the mother of all the sciences, and that each science was to be regarded as a particular method for the discovery of a clue to the universe; when these clues all became available, philosophy would bring them together and provide the solution to the riddle of the universe! This idea is virtually repeated by the authors, though of course much less naively, in what follows upon the passage just quoted. But we must cut our discussion here and proceed to one or two other points. There are quite a number of things in this book to which some readers will, no doubt, take exception. The various schools which come in for the authors' unrelenting criticism can be left to take care of themselves, but there is one point which is likely to escape attention to which we may refer here. One of the errors most commonly committed in discussing the rise of experimental science is repeated by the authors; it is that " Experimental science had to rise out of magic... " (p. 70). This is an error which dies hard. Magic and science are two separate activities which live cheek by jowl in the same community. Primitive peoples keep their magical and their scientific activities quite apart, and very clearly recognize and express the difference between them. Manipulation of the supernatural is rarely brought to bear in making a weapon, a spear-thrower, a utensil, a house, in reading a track, in firing a furnace, in numeration, and in many other secular activities involving the use of experience and reason. Magical practices may be associated with some of these activities, but the two are rarely confused. A blowpipe Indian believes that unless he " sings " his arrowpoint which he has tipped with curare the poison will not take effect or that he will miss his aim, but he never for a moment imagines that his magical activities have anything whatsoever to do with his manufacture and treatment of the weapon he uses. It would be absurd to say that because the artist of the Altamira cave drawings made his drawings for magical purposes he was no artist. His artistic ability and his magical beliefs and practices are not one and the same thing but two distinct things, and his art did not grow out of his magical beliefs, but is a separate activity brought in to assist his purposes through magic. Art and science have a very ancient and honourable lineage as distinctive activities, and it is

quite erroneous, not to say unnecessary, to trace their origins to magical practices.

Hahnemann Medical College, Philadelphia. M. F. ASHLEY-MONTAGU.

Federigo Enriques.—*Le matematiche nella storia e nella cultura*, Lezioni pubblicate per cura di ATTILO FRAJESE. II+339 pp., 22 plates. Bologna, NICOLA ZANICHELLI Editore, 1938.

FEDERIGO ENRIQUES has produced a remarkably well constructed book, which succeeds in showing the relationship of mathematics to history and to culture. The author has focused wide learning on the task in hand and has produced a book which, though not long, is clear and to the point. He has shown that the development of mathematics is related to the growth of ideas.

The volume is divided into three books. The first of these deals with the evolution of mathematics from antiquity to the eighteenth century. It shows this evolution by ideas and types of interest rather than by individual discoveries, although they, too, are mentioned. It is divided into four chapters treating respectively ancient, medieval and modern mathematics and the literature of mathematics, the latter being in the form of bibliographies.

The second book, which has seven chapters, treats mathematics and its relation to culture or civilization. It begins by showing the relation of mathematics to the other sciences. Sections are devoted to mechanics, the mechanical interpretation of physical phenomena, positivism, statistics, economics, the contrast between the mechanical and positivistic conceptions and the devolopment of the calculus of probabilities. Other sections deal with the second principle of thermodynamics and irreversible phenomena and with mathematics in relation to the sciences of electricity and magnetism, and to the sciences of life. The second chapter connects mathematics with technique or applied science and thus relates mathematics to the nineteenth century inventions which are the basis of our present civilization. The third chapter associates mathematics with philosophy, from earliest times to the present, noting the great modern metaphysical systems and the systems of rationalism from the Greek to SPINOZA's. The subject of infinity is dealt with, and the philosophies of KANT, MACH and OSTWALD are related to the mathematics of GAUSS, LOBACHEVSKI and BOLYAI, that is, to non-Euclidean geometry. The conclusion of this chapter begins by harking back to the words over the door of PLATO's school, " Let no one enter here who does not know geometry," but ends by saying that the application of mathematical symbols and techniques to philosophy is now suspect. The fourth chapter defines and evaluates mathematics. Mathematics as an art

receives the attention of a whole chapter, which stresses the influence of mathematics on the taste and judgment of artists. The sixth chapter, on mathematics and history, need not be summarized for readers of *Isis*, who already understand the importance of the history of ideas, but it is an important chapter in the construction of the volume under discussion. The seventh chapter has as its title "Psicologia delle Matematiche" and comes logically at the close of book two. The necessity for associating mathematical ideas with the general trends of thought is shown. Mathematics has been demonstrated to be an integral part of human thought.

The third book, which deals with certain directions taken by mathematics in the nineteenth century, can be considered separately, because it is not necessary to the unity of the volume, although the background offered by the first two books is valuable in understanding the third. More than a knowledge of the development of mathematics is necessary to appreciate this third book, which will prove useful to the advanced students of mathematics who have already received a working knowledge of the subject. Chapter one discusses the problems and development of qualitative analysis, chapter two treats the criticisms and theory of functions of a real variable, and the third chapter is concerned with developments in projective and algebraic geometry. The fourth chapter discusses the literature of mathematics and should prove serviceable to students of pure mathematics. It is difficult to keep abreast of the recent developments in a field as complex as mathematics, where advanced work can be done in one branch in complete oblivion of workers in other branches. Book three has made a real contribution by telling of new advances.

Indices are boons to scholars. This volume has an index of names, an index of illustrations and a detailed table of contents. The illustrations in the book are portraits of well-known mathematicians. Excellent specialized bibliographies are scattered through the volume.

New York City. C. DORIS HELLMAN.

Reginald L. Waterfield.—*A hundred years of astronomy.* The MACMILLAN Co., New York, 1938, pp. 526, price $5.75.

This book is one of "The Hundred Years Series" published by the MACMILLAN Co. and including volumes covering the progress in the last hundred years in various sciences. The author is a member of the Council of the Royal Astronomical Society and Director of the Mars Section of the British Astronomical Association, but is not a professional astronomer.

The spectacular development of astrophysics in the last fifty years

has created an impression among the general public and even among the younger astronomers of the present generation that the only worthwhile topic in astronomy to talk about is astrophysics. The author has not escaped this pitfall. If one looks through the publications of the great national observatories like Greenwich, Pulkovo, Paris and Washington, one cannot fail to be impressed with the tremendous amount of data referring to the positions of the stars, mostly meridian observations. These observations are the basis of the *Geschichte des Fixsternhimmels* just being completed by the Prussian Academy of Sciences for the northern hemisphere. They are the basis of our fundamental catalogues such as the FK3, the Boss Preliminary Catalogue, and finally the Albany General Catalogue. The structure of the sidereal universe cannot be understood without the knowledge of proper motions of the stars and these proper motions depend on the values of astronomical constants, such as that of precession, to be determined from fundamental catalogues. However, the author nowhere mentions this field of work in which the majority of astronomers were engaged until, say, 1880, and which even now is of the greatest importance in astronomy. In vain one would look for such names as AUWERS, KOPFF, NEWCOMB (the latter mentioned in another connection). Such a remarkable international enterprise as the Astrographic Catalogue is described in a few words, and the Astronomische Gesellschaft Catalogue is not even mentioned. It may be said that astrometry, which is in a sense the foundation of astrophysics, and the major field of effort for at least half of the period covered by the book, hardly exists as far as the author is concerned.

Another conspicuous absence is celestial mechanics. Not a word is said of the profound researches of HANSEN, DELAUNAY and HILL on the lunar theory. BROWN's work is noted only for its most spectacular result, the variation in the length of the day. Nothing at all is said about the development in the computation of orbits of celestial bodies. It would seem that no progress has been made in this branch of astronomy since the days of GAUSS, LAPLACE and OLBERS. Such an important aspect of gravitational astronomy as the computation of cometary orbits scarcely receives any notice except for brief mention of E. STRÖMGREN's work in its bearing on the cosmogony of the comets.

There is yet another important omission. The history of a science should concern itself not only with the accumulation of new data and development of new theories to account for these data, but also with the new appreciation of the work of the preceding generations. Babylonian astronomy, for instance, in the light of new researches is certainly not what it appeared to be to a scientist of a hundred years

ago. We should look, however, in vain in Mr. WATERFIELD's book for such names as EPPING, KUGLER or FOTHERINGHAM.

It is obvious from the foregoing that the book under review is not "A Hundred Years of Astronomy," but rather a hundred years of astrophysics and, to a lesser degree, of statistical astronomy. It is not difficult to see the pattern of Mr. WATERFIELD's work. It is "A History of Astronomy during the Nineteenth Century" by AGNES M. CLERKE published some fifty years ago. The organization of material (or perhaps lack of organization) is the same, as well as the scope of the work, the abhorrence of all mathematics and even the appendix at the end giving a chronological summary of the major developments in astronomy.

However, there are several differences between the two books and they are not in Mr. WATERFIELD's favor. First is the matter of references lacking in the text of the later book. The bibliography at the end of this book is certainly not sufficiently detailed to compensate for this omission. It is not easy for a person interested in a particular subject to find the necessary information scattered in dozens of scientific periodicals and observatory publications. Another point is the absence of illustrations, particularly important in astronomy. No amount of description of, say, galactic nebulae can give a better idea of their shapes and convolutions than a good photograph. Miss CLERKE's book has very few illustrations; Mr. WATERFIELD's has none. The third difference is greater emphasis by Miss CLERKE on instrumental development and methods with a separate chapter devoted to this subject lacking in Mr. WATERFIELD's book.

It is difficult to see how Mr. WATERFIELD's intention to make "a special point of explaining as far as possible the methods, both practical and theoretical, by which astronomers have arrived at their results" could be carried out without a much more detailed account of instrumental equipment and considerable mathematics. The author apparently consciously avoided the use of the simplest formula or diagram, (only two diagrams in the whole book !), creating thereby a necessity for lengthy descriptions. It seems to me that the mythical "intelligent layman," if at all interested in astronomy, should be expected to understand a bit of algebra or a diagram.

I have nothing but admiration for the author's account of matters which he considered proper to include in his book. The language is precise and lucid, and there is no circumlocution which is the plague of many modern essays. The book is remarkably accurate. I came across only a few errors and those rather unimportant. The subject is, of course, involved and the limitation of the scope of the book to the last one hundred years made it difficult to supply a proper perspective,

Mr. WATERFIELD was helped in this by the fact that there was no astrophysics a hundred years ago. Had he remained in this restricted field without feeble attempts in other directions, we would have a good history of astrophysics. Instead of this we have a book which gives a decidedly one-sided picture of the development of modern astronomy.

(*Perkins Observatory, Delaware, Ohio*) N. T. BOBROVNIKOFF.

Roger Burlingame.—*March of the iron men.* A social history of Union through invention. XVI+500 p., 15 pls., 76 figs. New York: CHARLES SCRIBNER's Sons, 1938. Price $3.75.

This is history from a new angle and a single one. The author attempts to write the history of the evolution of the social pattern of today in terms of the inventions which have influenced the course of civilization. Most of these inventions are, however, of world wide significance and their results in America have come about with the interaction of many other factors, not the least of which were the inventive trait of the New England stock and the undeveloped natural resources of a new and savage continent. The author writes enthusiastically and convincingly of the far-reaching effects of each of a long series of inventions which enhanced the speed and turned the courses of industrial, social, and political changes mainly during the first century of the history of the United States.

The term invention is used with a latitude of license to include such diverse activities as the organization of corporations and the discovery of gold in California. Perhaps the legal developments in the former are equalled only by the mining exchange and hydraulic gun of the latter.

Among the inventions and industrial activities whose history is traced, always against the background of the social environment, are the sailing ship and printing press in relation to emigration; the log cabin, of Scandinavian origin, which replaced the slab and wattle structures of the early colonists; the slow rise of the industries and the simplicity of machines among the colonists; the indentured servant; the manifold scientific and inventive activities of BENJAMIN FRANKLIN, ranging from the Franklin stove and static electricity to the American Philosophical Society; the effect of the industrial revolution in England upon colonial trade and politics; England's efforts to stifle the smelting of iron in America and its consequences; the stimulus of frontier necessities which led ROSSER to perfect the Pennsylvania rifle, no small factor in the success of the American Revolution; the indirect effect of the Revolution upon invention of machinery for the textile industry, flour mills, arms and ammunition, and even a primitive submarine; WHITNEY's cotton gin and the impetus it gave to slavery in the South and textiles in the North;

the far more significant introduction by WHITNEY of the principle of mass production first applied by him to the production of rifles for the government; the futile efforts of FITCH and STEVENS to overcome the inertia which deferred steam navigation; the steel plough of DEERE and OLIVER's application of chilled steel to this implement; the slow arrival of the railroad; the slow sequences of discovery in electrical science by GALVANI, VOLTA, NICHOLSON and DAVY, OERSTED, AMPÈRE, WHEATSTONE, JOSEPH HENRY, and MORSE and VAIL which resulted in the telegraph.

Then followed the period after 1850 of rugged individualism with its growth of capitalism, the publication of DARWIN's theory of natural selection (entirely omitted by the author), with the exploitation of ether; rubber; the clipper ship; the revolver; the emancipation of woman by the sewing machine; cheap paper; the power press; the foreordained defeat of the South by the lack of industries based on inventions and the resulting Union.

The author has amply documented his text and has supplied a bibliography on the subject of inventions with a classified list of authors and parallel columns of dates of historical events and inventions.

The author has adhered rather closely to inventions. He failed to relate these to scientific discovery, except in the case of the telegraph, as fully as might be desirable in an adequate historical treatment of the subject.

CHARLES A. KOFOID

Åke Åkerman, I. Granhall, G. Nilsson-Leissner, A. Müntzing, and **O. Tedin.**—*Swedish contributions to the development of plant breeding.* (New Sweden Tercentenary Publications.) 111 p., [62] figs. 8 tables. Stockholm: ALB. BONNIERS Boktryckeri, 1938. Price $1.00.

This is a historical account of the Swedish Seed Association, the Svalöf Plant Breeding Institute, the Central Seed Testing Station, the Institute of Genetics of the University of Lund, the Weibullsholm Plant Breeding Station, and other governmental and industrial agencies actively engaged in plant breeding or testing its results in cooperative enterprises in Sweden. Plant breeding commenced in 1886 using methodical selection based on DARWIN's natural selection. The failures in this method were scientifically explained by JOHANNSEN's (1903) pure line results. Pedigree culture was introduced at Svalöf by NILSSON (1906), but single plant selection was initiated there as early as 1890. Cross-breeding was introduced at Svalöf before 1900 and new varieties of wheat were originated thereby. In 1897 PEHR BOLIN published a

paper in which he distinguished between "typical" and "casual" characters, the former being inherited in the first generation, and the latter only more or less casually in the following generations. These two classes of characters correspond to the dominant and recessive ones distinguished earlier (1866) by MENDEL. The fullness with which BOLIN comprehended the results of hybridization in Mendelian terms is indicated in the following quotations: "In the first generation after a cross no variation occurs." "In the inheritance of the typical characters in the second and following generations a certain regularity seems to prevail. The forms occurring here represent all possible combinations of the parental characters, and it is thus possible to anticipate them with an almost mathematical accuracy." He did not, however, state the ratios, though he did observe that the variation after a cross sometimes extended beyond the limits shown by the two parents.

The authors give a succinct account of more recent work on wheat, barley, rye, sugar beets, mangels, turnips, swedes, carrots, potatoes, grasses, and clovers. A chapter is devoted to the induction of chromosome changes and mutations by temperature changes, and by X-ray, and an account of wheat-rye hybrids.

CHARLES A. KOFOID.

F. O. Bower.—*Sixty years of botany in Great Britain* (1875-1935). Impressions of an eye-witness. XII+112 p., 14 pls. New York: The MACMILLAN Co., 1938. Price $ 3.75.

This is an autobiography of an eye-witness of and a participant in the evolution of modern scientific botany in the educational system of Britain throughout the periods of its initiation, growth, differentiation into specialities, and adjustment to social and imperial opportunities. Its general historical values arise in part from this chronological opportuneness and in no small degree from the central position of the author in botany at Cambridge, London, and Glasgow. It records the recourse of British students to the laboratories of SACHS, DE BARY, and GOEBEL for botanical instruction and inspiration, his own participation in the introduction of the modern objective laboratory method in botany, the initiation of botanical instruction in the schools and universities, and the establishment of *The Annals of Botany*. It records the scientific lethargy attendant upon the plethora arising from industrial expansion, the emphasis upon systematic botany incident to exploration and imperial expansion, the slow liberation of plant physiology as a distinct botanical discipline, the shifts of emphasis in the field of plant morphology, and the rise of paleobotany. The author reviews the problems associated with the origin of phanerogams in the light of life cycles, structure, and develop-

ment of the Archigoniatæ and forecasts the future fusion of the study of structure and function in creating a dynamic morphology. He strikes a significant note in his invitation to research upon the factor of size in relation to form. A chapter on *dramatis personæ* gives brief estimates (with portraits) of the personalities and scientific work of T. H. HUXLEY, W. T. THISELTON-DYER, S. H. VINES, H. MARSHALL WARD, I. B. BALFOUR, D. H. SCOTT, W. C. WILLIAMSON, R. KIDSTON, and FRANCIS DARWIN. It is a critical source book of primary importance covering a most important period of British botany and of this science in general.

CHARLES A. KOFOID.

Elmer D. Merrill and **Egbert H. Walker.**—*A Bibliography of Eastern Asiatic Botany*. XII+719 p. Jamaica Plain, Mass. : The Arnold Arboretum of Harvard University, 1938. Price $ 12.50.

This is a cooperative enterprise sponsored by the Arnold Arboretum, Smithsonian Institution, New York Botanical Garden, and Harvard-Yenching Institute. It includes literature on Eastern Asiatic botany through 1936 with the addition of parts of papers continuing into 1937. The area covered includes Asia from Eastern Siberia south through China and Tibet supplemented by comprehensive works dealing with the botany of adjacent areas from the Philippine Islands to India, and Central Asia and Siberia. Only publications with distinct taxonomic, geographic, or economic significance are included, but considerable latitude is exercised in the cryptogamic field and in general fields. Accordingly papers on ecology, phytogeography, exploration, economic botany, the history of botany, phylogeny, pathology, agriculture, horticulture, forestry, materia medica, pharmacy, and biography are admitted, and especial attention is given to citations of bibliographical data. Both papers from serials and independent works are included. The original papers were examined whenever possible and noted as " not seen " if not available. Russian titles have been transliterated according to the rules of the Library of Congress, Chinese titles by the Wade system, and Japanese by the Hepburn system except in the case of the names of authors who themselves used other systems in transliterating their own names.

Over 1200 serials are listed with annotations of general utility. The form of serial citation is that adopted by the Madison Botanical Congress of 1895. Dates are determined with care and the sources indicated in difficult citations. Titles are annotated when they were inadequate in characterizing the content of the article and also to cite republications and comments by other authors. There are over 1400 such cross

references. This bibliography contains over 21,000 author entries and is the most extensive in its field.

Appended to the extensive *Index of Authors and Titles* is an annotated list of *Older Chinese Works* of 105 references; a *Reference List of Oriental Serials* with original titles of each and its transliteration and abbreviation; *Reference Lists of Oriental Authors*, with original, transliteration, and variants of Chinese and Japanese names; an extensive *Subject Index;* and a *Family Index of Generic Names.*

As source material in the history of botanical science such a bibliography is of great significance not only as a guide to the literature of a great area in the whole period of its development up to 1936, but as an index of investigators and an indicator of scientific trends in three great peoples, Russian, Chinese, and Japanese, and in the last two in the period of the initiation of scientific research along lines of Occidental culture.

The authors are qualified by knowledge, interest, and experience to undertake this great task in the interest of future investigations. They have accomplished it with meticulous care and their introductory comments warn the user of this bibliography of its inevitable shortcomings but only suggest the difficulties overcome in the accomplishment of this scholarly labor for the good of the cause of botanical science in the Orient. CHARLES A. KOFOID.

H. M. Gardiner, Ruth Clark Metcalf, and **John G. Beebe-Center.**—*Feeling and emotion. A history of theories.* XII+445 p. New York, American Book Company, 1937. Price $ 4.00.

This fourth volume in the American Psychology Series edited by HENRY E. GARRETT is a composite work begun by the late Professor GARDINER who completed the first eight chapters covering the period from HERACLITUS to HUME and a part of the ninth, a survey of the French and German psychologists of the 18th century from ROUSSEAU to KANT and MAASS. These chapters were revised and completed by his pupil and colleague, Professor RUTH C. METCALF. The two chapters on the 19th and 20th centuries are from the pen of Professor J. G. BEEBE-CENTER.

The first three chapters review the Greek and Roman period, the fourth the patristic and mediaeval, and the fifth the Renaissance. In DE LA CHAMBRE's *Les caractères des passions* (1658) we find that his experience as a physician leads to an admixture of the purely theoretical approach to emotions with the objective and comparative. He combines mediæval tradition with the more modern learning, and credulity with observation and independence of judgment. He urges that each passion has its own peculiar expression and this teleological end is attained by spirits, humors, and voluntary muscles, and criticises DESCARTES for localizing

the soul in the pineal body. He at least endeavors to use the scientific approach in the study of the emotions which FRANCIS BACON urged, but never practiced, in his *Georgics*, or *Culture of the Mind* in VII,3 of his *Advancement of Learning*.

Chapter six discusses DESCARTES and MALEBRANCHE, seven is concerned with the 17th century, primarily with SPINOZA and HOBBES, and eight with British moralists and associationists of the 18th century. Chapter ten deals with *Affective Psychology of the 19th Century* and perforce must consider DARWIN's *Expression of the Emotions* which Professor BEEBE-CENTER characterizes as a classic and the most important work on emotion of the 19th century. This work generalized " the universe of discourse " to include both man and animals, offered a rich fund of concrete exemplifications, and organized the material under the three principles of serviceable associated habits, antithesis, and direct action of the nervous system.

This appreciation of DARWIN's contributions is greatly negatived by the criticism that SPENCER (June, 1872) had largely anticipated DARWIN's (August, 1872) laws, and that " as far as theoretical contribution is concerned DARWIN's book is not outstanding." Quite true, if theory is the essence of psychology as seems to be the case in the closing chapter which is concerned with *Twentieth Century Theories* and deals largely with the conflicting views of CANNON, DUMAS, and WATSON; recognizes that the modern theory of feeling and emotion is the organic theory; and calls psychophysiological correlations monstrosities. The book is a consistent presentation of psychological theories. The word endocrinology does not occur in the 35 pages of the excellent index though there are three citations of casual references to glands.

C. A. KOFOID.

The Editor of Isis

HARVARD LIBRARY, 185
CAMBRIDGE, MASS.

January 30, 1939.

Dear Sir :

The enclosed report is submitted as a matter of routine to the members of the council of the HSS, to the members of the editorial board of *Isis*, and to a few other friends. It shows a loss of $654.27, which is exceptionally large, because too much money was spent in advertizing, and too many pages were published. The capacity of *Isis* will be reduced to 800 p. in 1939.

The *Osiris* account shows a deficit of $1,105.61. Thus the Editor's total loss amounted to $1,759.88, this being by far the heaviest annual loss borne by him during the last twenty-five years, and entirely out of proportion with his income.

It is planned to publish in 1939 vol. 30 of *Isis*, plus only a third of vol. 31, and vols. 6 and 7 of *Osiris*.

The Library of Congress devotes special cards (available in all great libraries) to every article published in *Osiris*, but not to those published in *Isis*, these being too numerous.

Sincerely yours,

GEORGE SARTON.

P.S.—The *Isis* report for 1937 appeared in *Isis*, vol. 29, 304-5, 1938.

ISIS REPORT FOR 1938

This report covers vols. 28 and 29, that is, a total of 1222 p., with 16 pl., 61 fig., including 38 articles, 40 shorter items, 142 reviews and 2750 bibliographic notes (in all 2970 items).

Summary of accounts

	Expenditures			*Receipts*	
1. Printing	$2,512.36		HSS		$1,899.00
2. Plates, fig.	184.82	$2,697.18	C. I.		1,200.00
Mailing		594.35	Sales, Bruges		826.85
Royalties			Sales, U. S.		2.00
Reprints	211.92				
Gifts	13.33	225.25			$3,927.85
Editorial					
Brussels	222.07				
Cambridge	241.62				
Chicago	132.91	596.60			
Overhead					
Stock, insurance	101.93				
Advertizing	366.81	468.74	Editor's loss		654.27
3.		$4,582.12			$4,582.12

The cost of printing (items 1 and 2) averaged $2.20 per illustrated page; the total cost (item 3), $3.75.

This account is only approximately correct as I have not bothered about the fluctuations of the exchange.

OSIRIS REPORT FOR 1938

This report covers vols. III(2), IV(2), and V, a total of 1143 p., 9 pl., 72 fig., containing 17 memoirs.

Summary of accounts

	Expenditures			*Receipts*	
1. Printing	$1,941.77		Bruges sales	$817.22	
2. Plates, fig.	183.33	$2,125.10	U. S. sales	143.35	$960.57
Mailing		52.60	Subsidies		811.00
Royalties			Refunded for		
Reprints	248.10		reprints		31.25
Cash	125.00	373.10			
Editorial					$1,802.82
Brussels		200.00			
Advertizing		157.63	Editor's loss		1,105.61
3.		$2,908.43			$2,908.43

The cost of printing (items 1 and 2) averaged $1.86 per illustrated page; the total cost (item 3) averaged $2.54. These costs are smaller than for *Isis* for two reasons : (1) the number of copies of *Osiris* is but half as large (500 vs. 1,000); (2) most of the overhead expenses are charged to *Isis* rather than *Osiris*.

Fifty-seventh Critical Bibliography

of the

History and Philosophy of Science and of the History of Civilization

(*to May* 1939—*with special reference to cent. I to VII inclusive*)

The fifty-seventh bibliography contains about 1160 items of which 150 deal with the Ist to VIIth centuries after Christ. They have been kindly contributed by the following nineteen scholars belonging to four different countries :

C. W. Adams (Hertford, England)
M. F. Ashley-Montagu (Philadelphia)
I. B. Cohen (Cambridge, Mass.)
A. R. Goldsmith (Cambridge, Mass.)
L. Guinet (Brussels)
C. A. Kofoid (Berkeley, Cal.)
I. Kratchkovsky (Leningrad)
O. Larsell (Portland, Oregon)
C. D. Leake (San Francisco, Cal.)
R. K. Merton (New Orleans, La.)
D. Norman (Cambridge, Mass.)
W. Pagel (Cambridge, England)
J. Pelseneer (Brussels)
A. Pogo (Cambridge, Mass.)
S. Sakanishi (Washington, D.C.)
G. Sarton (Cambridge, Mass.)
D. J. Struik (Cambridge, Mass.)
H. R. Viets (Boston)
C. Zirkle (Philadelphia, Pa.)

This Bibliography includes as usual a series of addenda and errata to Sarton's *Introduction to the History of Science*, vols. 1 and 2 (Baltimore and London, 1927 and 1931). Its purpose and methods have been explained in the preface to the 38th Critical Bibliography (*Isis* 20, 506-08).

The sections relative to the Ist to VIIth centuries after Christ are especially full, as I have liquidated as much as I could of my stock of notes concerning them.

I have in my drawers a large number of notes which I will be glad to publish as soon as I have been able to check them upon the originals.

The Historical and racial classification (Part II) contains a new section (IV), " The New World and Africa " divided into three subsections (a) America, (b) Oceania, (c) Africa. (These subsections have not been numbered in order not to disturb the numbering of sections of Part III).

I entreat the authors of relevant books and papers to send me copies of them *as promptly as possible* in order that their studies may be registered in this bibliography and eventually reviewed and discussed. By so doing they will not simply help me and every other historian of science but they will help themselves in the best manner, for they will obtain for their work the most valuable publicity and its certain incorporation into the literature of the subject.

Most of the notes were selected by me. They were typed by Miss FRANCES SIEGEL and the typing read by I BERNARD COHEN. The proofs were read by Dr. A. POGO.

Harvard Library, 185 GEORGE SARTON.
Cambridge, Mass. May 22, 1939.

PART I

FUNDAMENTAL CLASSIFICATION (CENTURIAL)

IXth century B.C.

Bassett, Samuel Eliot. The poetry of HOMER. VII+273 p. (Sather classical lectures, 15). University of California Press, 1938. ISIS

" These lectures were not delivered. Death came gently to SAMUEL ELIOT BASSETT in the quiet of his study, on the twenty-first of December, 1936, not long after he had completed his manuscript and only a few days before he was to have begun his journey to Berkeley. Few American Hellenists have made greater contributions to the true understanding of ancient Greek literature, and none has been more beloved and respected." Contents : 1. An important Homeric problem and its postulates; 2. The epic illusion; 3. The epic illusion (continued); 4. The breaking of the epic illusion; 5. The poet and his audience; 6. The poet as singer; 7. HOMER the poetic demiurge; 8. The poet as realist and as idealist.

Gilbert, Pierre. HOMÈRE et l'Égypte. *Chronique d'Égypte* 14, 47-61, 1939. ISIS

Vth century B.C.

Bouquet, Henri. Thèse et serment. Feuilleton du *Temps* du 20 novembre 1938. ISIS

Apropos of the recent reëstablishment of the Hippocratic oath by the Faculty of Nancy, and of other French Faculties. Montpellier never interrupted that tradition. G. S.

Caballero, Ricardo. Explicación de algunos libros Hipocráticos. Córdoba, Facultad de Ciencias Médicas (Cátedra de Historia de la Medicina), 30 p., 1938. ISIS

Diepgen, Paul. Die Hippokratiker und die Lehre von Blutkreislauf. *Münchener Medizinische Wochenschrift* Nr. 8, S. 299, 1939. ISIS

Diepgen, Paul. HIPPOKRATES im neuen Licht. *Hippokrates* H. 48, 1237-39, 1938. ISIS

Diepgen, Paul. Nochmals zur Frage der Kenntnis des Blutkreislaufs in den hippokratischen Schriften. *Hippokrates* H. 15, 385-86, 1938. ISIS

Edelstein, Ludwig. The genuine works of HIPPOCRATES. *Bulletin of the History of Medicine* 7, 236-48, 1939. ISIS

(Hippocrates). Die Werke des HIPPOKRATES. Die hippokratische Schriftensammlung in neuer deutscher Übersetzung. Herausgegeben von RICHARD KAPFERER, unter Mitwirkung von GEORG STICKER, u.a. Stuttgart, Hippokrates Verlag, 1934 ff. ISIS

Kapferer, Richard. Der Blutkreislauf, die Art seiner Darstellung in den hippokratischen Schriften. *Münchener Medizinische Wochenschrift* Nr. 8, S. 295, 1939. ISIS

Kenney-Herbert, A. The Elephantine Aramaic papyri. *Isis* 29, 393-97, 1938. ISIS

Lecène, P. Remarques sur le chapitre des " luxations du genou " dans le traité hippocratique " sur les articulations." *Comptes rendus du deuxième congrès international d'histoire de la médecine* (Paris, 1921), p. 177-81, Évreux, 1922. ISIS

Panayotatou, Dsse. La peste de THUCYDIDE. La peste d'Athènes. *Comptes rendus du deuxième congrès international d'histoire de la médecine* (Paris, 1921), p. 533-37, Évreux, 1922. ISIS

Singer, Dorothea Waley. An early Latin text of the sixth book of the Epidemics. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd 1922), p. 50-53, Antwerp, 1923. ISIS

Unger, F. C. FOES et LITTRÉ. *VI^e congrès international d'histoire de la médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 59-61, Anvers, 1929. ISIS

Apropos of their Hippocratic studies. G. S.

IVth century B.C. (whole and first half)

Bidez, J. PLATON et l'Orient. *Acad. r. de Belg., Bull. de la Cl. des Lettres* 24, 512-16, 1938. ISIS

Lachièze-Rey, Pierre. Les idées morales, sociales et politiques de PLATON. 220 p. Paris, BOIVIN, 1938. ISIS

Lindsay, Prof. Medicine as viewed by PLATO and ARISTOTLE.

Proceedings of the Third International Congress of the History of Medicine (London, July 17th to 22nd, 1922), p. 182-85, Antwerp, 1923. ISIS

Thompson, D'Arcy Wentworth. DIOCLES of Carystus. *Philosophical Review* 210-16, March 1939. ISIS

Apropos of WERNER JAEGER's recent work on DIOCLES (Berlin, 1938). There has been much discussion as to DIOCLES's date. Following MAX WELLMANN (1901) I had placed him in PLATO's time, considering him a late contemporary of HIPPOCRATES (*Introd.* 1, 121). JAEGER " harks back to the older view that DIOCLES is a post-, not a pre-Aristotelian; that he was an active man in the last quarter of the fourth century, as certain earlier scholars had believed; that he lived on into the first decade of the third century; and that, in short, he flourished not during the old age of HIPPOCRATES but more than half a century later, after THEOPHRASTUS had put on the mantle of ARISTOTLE " (p. 211). The author doubts those conclusions and discusses them. G. S.

IVth century B.C. (second half)

Hatch, Melville H. THEOPHRASTUS of Eresos as an economic entomologist. *Journal of the New York Entomological Society* 46, 223-27, 1938. ISIS

Sayili, Aydin M. The Aristotelian explanation of the rainbow. *Isis* 30, 65-83, 4 fig., 1939. ISIS

Contents : I. Introductory remarks; II. ARISTOTLE's theory of colors; III. Explanation of the order of the colors in the primary and the secondary rainbows; IV. Some other facts and uniformities observed by ARISTOTLE; V. ARISTOTLE's knowledge of reflection; VI. The shape of the rainbow; VII. The lunar rainbow; VIII. Conclusion; IX. Appendix : Chinese literature on the rainbow.

IIIrd century B.C. (whole and first half)

Lejeune, Albert. A propos d'une traduction de l'optique et de la catoptrique d'EUCLIDE. *Revue des questions scientifiques* 402-10, 20 novembre 1938. ISIS

Apropos of PAUL VER EECKE's French translation (Bruges, 1938).

Vanhée, L. EUCLIDE en chinois et mandchou. *Isis* 30, 84-88, 1939. ISIS

IIIrd century B.C. (second half)

Dijksterhuis, E. J. ARCHIMEDES. 8+213 p. Groningen-Batavia, NOORDHOFF, 1938. ISIS

Reviewed by L. C. KARPINSKI, *American Mathematical Monthly* 46, 41, 1939. Dutch version of the main Archimedean works with historical introduction. G. S.

Guéraud, O.; Jouguet, P. Un livre d'écolier du III^e siècle avant J.-C. XXXI+60 p., 10 pl. (Publications de la Société royale égyptienne de Papyrologie, textes et documents, II). Le Caire, Imprimerie de l'Institut français d'archéologie orientale, 1938. ISIS

Reviewed by MARCEL HOMBERT, *Chronique d'Égypte* 14, 171-73, 1939.

Ist century B.C. (whole and first half)

Neugebauer, O. Über eine Methode zur Distanzbestimmung Alexandria-Rom bei HERON. II. *Det Kgl. Danske Vidensk. Selskab. Historisk-filologiske Meddelelser*. 26, 11 p., 4 fig., 1939. ISIS

Puech, A. L'épitaphe du médecin ASCLÉPIADÈS (I. G. Ital. et Sicil. 1424). *Annuaire de l'Institut de philologie et d'histoire orientales et slaves* 6, 199-201, 1938. ISIS

Ist century B.C. (second half)

Aly, Wolf. Der STRABON-Palimpsest. Vat. Gr. 2061 A. 45 p., 3 pl. *Sitzungsberichte der Heidelberger Akademie der Wissenschaften, philosophisch-historische Klasse*, Jahrgang 1928/29, 1. Abhandlung, 1928. ISIS

Berthelot, A. L'Europe occidentale d'après AGRIPPA et STRABON. *Revue archéologique* 1, 9-12, 2 maps, 1933. ISIS

(Ovid). La métamorphose d'OVIDE figurée. Collection d'unica et de livres rares de la Bibliothèque nationale. Paris, Éditions des bibliothèques nationales de France, 1933. ISIS

Reproduction en facsimile de la *Métamorphose* d'OVIDE, publiée par JEAN DE TOURNES à Lyon en 1557, et considérée, avec ses 178 délicates vignettes dues à BERNARD SALOMON, comme un des chefs-d'œuvre du livre illustré en France au XVI^e s. Les planches sont accompagnées d'une notice rédigée par ROBERT BRUN, et d'un avant-propos de JULIEN CAIN. L. G.

Schuhl, Pierre-Maxime. Un mécanisme astronomique dans la quatrième églogue de VIRGILE. *Revue archéologique* 31, 246-52, 1 fig., 1930. ISIS

" Adspice convexo nutantem pondere mundum " (*Ecl.*, IV, 50).

Uhden, Richard. Zur Überlieferung der Weltkarte des AGRIPPA (auf Grund der unlängst im Cod. Vat. lat. 6018 der Etymologiae des ISIDOR VON SEVILLA aus der 2. Hälfte des 8. Jhdts. entdeckten Kopie). *Klio* 26(8), 267-78, 1933. ISIS

Ist century (whole and first half)

Charpentier, Jarl. The Indian travels of Apollonius of Tyana. 66 p. (Skrifter utgivna av K. Humanistika Vetenskaps-Samfundet i Uppsala, 29). Uppsala, Almqvist, 1934. ISIS

Dalman, Gustav. Sacred sites and ways : studies in the topography of the Gospels. Translation by Paul P. Levertoff. xii+398 p., 25 maps. New York, Macmillan, 1935. ISIS

Geiger, Franz. Philon von Alexandreia als sozialer Denker. xi+118 p. (Tübinger Beiträge z. Altertumswiss., 14). Stuttgart, Kohlhammer, 1932. ISIS

Goodenough, Erwin R. By light, light : the mystic gospel of Hellenistic Judaism. xv+436 p. New Haven, Yale University Press, 1935. ISIS

Heinemann, Isaak. Philons griechische und jüdische Bildung. Kulturvergleichende Untersuchungen zu Philons Darstellung der jüdischen Gesetze. 598 p. Breslau, Marcus, 1932. ISIS

Hennig, Richard. Das Geburts- und Todesjahr Christi. Eine wissenschaftliche Prüfung der überlieferten Unterlagen, insbesondere der Berichte über den Stern von Bethlehem und die Sonnenfinsternis am Todestage Jesu. 62 p. Essen, Fürstenau, 1936. ISIS

Hopfner, Theodor. Die Brahmanen Indiens und die Gymnosophisten Ägyptens inder Apolloniosbiographie des Philostratos. *Archiv orientální* 6, 58-67, 1934. ISIS

Stein, Edmund. Philo und der *Midrasch*. Philos Schilderung der Gestalten des Pentateuch verglichen mit der des *Midrasch*. iv+52 p. (Beihefte zur Zeitschrift für die Alttestamentl. Wissensch., 57). Giessen, Töpelmann, 1931. ISIS

Stein, Edmund. Die allegorische Exegese des Philo aus Alexandreia. v+61 p. (Beihefte zur Zeitschrift für die alttestamentliche Wissenschaft, 51). Giessen, Töpelmann, 1929. ISIS

Ist century (second half)

Belkin, Samuel. The Alexandrian source for contra Apionem, II. *Jewish Quarterly Review* 27, 1-32, 1936. ISIS

Bresse, G. Le théorème de MÉNÉLAÜS à propos du birapport d'un faisceau de 4 droites. *L'Enseignement scientifique* 9, 243, 1936. ISIS

Gordon, Hirsch Loeb. MATTIA BEN HARESH medico romano del primo secolo. 7 p. *Policlinico* 1934. ISIS

Jackson, F. J. Foakes. JOSEPHUS and the Jews. The religion and history of the Jews as explained by FLAVIUS JOSEPHUS. XVI+299 p. London, Society for Promoting Christian Knowledge, 1930. ISIS

Josephus, Flavius. La prise de Jérusalem de JOSÈPHE LE JUIF. Texte vieux-russe publié intégralement par V. ISTRIN sous la direction de ANDRÉ VAILLANT, traduit en français par PIERRE PASCAL, t. 1. XIV+253 p. Paris, Institut d'Études slaves, 1934. ISIS

Krause, Max. Die Sphaerik von MENELAOS aus Alexandrien in der Verbesserung von ABÛ NAṢR MANṢÛR B. 'ALI B. 'IRÂQ. Mit Untersuchungen zur Geschichte des Textes bei den islamischen Mathematikern. VII+255 p.+110 p. in Arabic, figs. (Abhandlungen der Gesellschaft der Wissenschaften zu Göttingen, philologisch-historische Kl. 17). Berlin, WEIDMANN, 1936. ISIS

Reviewed by SOLOMON GANDZ and GEORGE SARTON, *Isis* 29, 417-23, 3 fig., 1938.

Lake, Kirsopp. PAUL, his heritage and legacy. 153 p. (The Mary Flexner lectures on the humanities, 1). New York, Oxford University Press, 1934. ISIS

Linckenheld, E. PLINE et le calendrier gaulois. *Revue celtique* 48, 137-44, 1931. ISIS

Nicol, John. The historical and geographical sources used by SILIUS ITALICUS. 179 p. Oxford, BLACKWELL, 1936. ISIS

(Pliny, the Elder). The elder PLINY's chapters on chemical subjects. Part 2. Edited, with translation and notes, by KENNETH C. BAILEY. 299 p. London, ARNOLD, 1932. ISIS

Rappaport, Salomo. Agada und Exegese bei FLAVIUS JOSEPHUS. XXXVI+140 p. (Veröffentl. der H. P. Chajes-Preisstiftung an der israelitisch-theologischen Lehranstalt in Wien. III. Bd.). Wien, KAUFFMANN, 1930. ISIS

Sprague, T. A. Technical terms in RUELLIUS' DIOSCORIDES. *Royal Botanic Gardens, Kew, Bulletin of Miscellaneous Information*, 2, 145-85, 1936. ISIS

Svoboda, K. Les idées esthétiques de PLUTARQUE. *Mélanges* BIDEZ, p. 917-46, Bruxelles, 1934. ISIS

(Tacitus). Studien zu TACITUS. CARL HOSIUS zum 70. Geburtstag gewidmet. 150 p. (Würzburger Studien z. Altertumswiss., 9). Stuttgart, KOHLHAMMER, 1936. ISIS

Wellmann, Max (d. 1933). Beiträge zur Quellenanalyse des Älteren PLINIUS. II. Teil. *Hermes*, 68, 93-105, 1933. ISIS

Wethered, H. N. The mind of the ancient world : a consideration of PLINY's Natural History. XV+302 p. London, LONGMANS, GREEN, 1937. ISIS

Reviewed by F. S. MARVIN, *Nature* 141, 708-09, 1938.

IInd century (whole and first half)

Asvaghosha. The *Saundarananda* or Nanda the Fair. Translated from the original Sanskrit of AŚVAGHOSHA by E. H. JOHNSTON. XII+124 p. (Panjab University Oriental Publications, no. 14). London, MILFORD, 1932. ISIS

Berthelot, André. L'Irlande de PTOLÉMÉE. *Revue celtique* 50, 238-47, 1933. ISIS

Bonacker, Wilh.; Anlicker, E. Über die Bologneser und Florentiner PTOLEMÄUS-Ausgaben und ihre Datierung. *Schweiz. Gutenbergmuseum* 17, 24-35, 1931. ISIS

Burkitt, Francis Crawford. Church and gnosis. A study of Christian thought and speculation in the second century. IX+153 p. Cambridge, University Press, 1932. ISIS

Derancourt. Reconstitution des coordonnées géographiques de PTOLÉMÉE sur le littoral atlantique et variations littorales entre Loire et Gironde. *Rev. archéolog.* 31, 74-92, 3 fig., 1930. ISIS

Finkelstein, Louis. AKIBA : scholar, saint and martyr. XXIV+363 p. New York, COVICI FRIEDE 1936. ISIS

Goddard, Dwight. The principle and practice of Mahayana Buddhism, an interpretation of Professor SUZUKI's translation of ASHVAGHOSHA's Awakening of faith. XXVI+100 p. Thetford, VERMONT, 1933. ISIS

Kubitschek, Wilhelm. Studien zur Geographie des PTOLEMÄUS. I. Die Ländergrenzen (*οἱ περιορισμοί*). 161 p. (Akademie der Wissenschaften in Wien, philos.-hist. Kl. Sitzungsberichte, 215 : 5). Wien, HÖLDER-PICHLER-TEMPSKY, 1935. ISIS

Lévi, Sylvain. Encore AŚVAGHOSHA. *Journal asiatique* 213, 193-216, 1928. ISIS

Meyerhof, Max. L'opération de la cataracte du chirurgien ANTYLLE D'ALEXANDRIE. (II[e] siècle après J.-C.). Livre d'or du Dr. THÉODORE L. PAPAYOANNOU, p. 115-19. Naumburg, LIPPERT, 1932. ISIS

Mørland, Henning. RUFUS De podagra. 39 p. (Symbolae Osloenses Fasc. supplet. 6). Oslo, BRØGGER, 1933. ISIS

Okulicz, L. La valeur de l'Œuvre astronomique de CLAUDE PTOLÉMÉE à la lumière des recherches nouvelles. *Scientia* 54, 450-56, 1933. ISIS

(Ptolemy, Claudius). Die Harmonielehre des KLAUDIOS PTOLEMAIOS. Hrsg. v. INGEMAR DÜRING. CIV+147 p. (Göteborgs Högskolas Årsskrift XXXVI. 1930, 1). Göteborg, ELANDER, 1930. ISIS

Silverstone, A. E. AQUILA and ONKELOS. XII+172 p. (Publications of the University of Manchester no. 214, Semitic languages series, no. 1). Manchester, University Press, 1931. ISIS

Steche, Theodor. Altgermanien im Erdkundebuch des CLAUDIUS PTOLEMÄUS. 192 p., maps. Leipzig, HABITSCH, 1937. ISIS

Thierfelder, Andreas. Beiträge zur Kritik und Erklärung des APOLLONIUS DYSCOLUS. 91 p. (Abh. d. Sächs. Akad. d. Wiss., phil.-hist. Kl. 43). Leipzig, HIRZEL, 1935. ISIS

Uhden, Richard. Das Erdbild in der Tetrabiblos des PTOLEMAIOS. *Philologus* 88, 302-25, 2 fig., 1933. ISIS

Wilson, Robert Smith. MARCION. A study of a second-century heretic. 190 p. London, CLARKE, 1933. ISIS

IInd century (second half)

Campbell, Donald. GALEN, the flower of the anatomical school of Alexandria, with special reference to his works which were translated into Arabic, and the Greek, Latin and Arabic MSS. of his work on anatomical administration, and the inference to be drawn therefrom. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 147-49, Antwerp, 1923. ISIS

(Galen). GALENI De causis procatarcticis libellus, a NICOLAO REGINO in sermonem latinum translatus. Ad codicum fidem rec., in graec. sermon. retrovertit KURT BARDONG. XXXIV+64 p. Leipzig, TEUBNER, 1937. ISIS

(Galen). GALENI De propriorum animi cuiuslibet affectuum dignotione et curatione. De animi cuiuslibet peccatorum dignotione et curatione. De atra bile. (Corp. med. Graec. 5, 4, 1, l.). Ed. WILKO DE BOER, XVI+166 p. Leipzig, TEUBNER, 1937. ISIS

(Galen). GALENI in HIPPOCRATIS epidemiarum libros 1, 2 et 3, (commentaria). Edidit ERNST WENKEBACH. (Corp. med. Graec. 5, 10, 1). Leipzig, TEUBNER, 1934-36. ISIS

(Galen). GALENI in PLATONIS Timaeum commentarii fragmenta. Coll. dispos. explicavit HENRICUS OTTO SCHRÖDER. Appendicem arabicum addidit PAULUS KAHLE. XXVIII+112 p. (Corpus medicorum Graecorum supplementum ad Ac. Berolinensis Havniensis Lipsiensis, 1). Leipzig, TEUBNER, 1934. ISIS

(Galen). Die Leibesübung mit dem kleinen Ball (*περὶ τοῦ διὰ τῆς σμικρᾶς σφαίρας γυμνασίου*). Aus dem Griechischen übersetzt, eingeleitet und erklärt von JOHANN MARKER. 20 p. Berlin, REHER, 1932. ISIS

Schütze, Kurt. GALEN. Die Übung mit dem kleinen Ball. 14 p. (Kl. Texte zur Gesch. u. Lehrweise d. Leibesübungen, hrsg. v. d. Reichsakademie f. Leibesübungen). 14 p. Berlin, WEIDMANN, 1936. ISIS

Walsh, Joseph. GALEN's treatment of pulmonary tuberculosis. *Amer. Rev. of Tubercul.* 24, 1-41, 9 fig., 1931. ISIS

Walzer, Richard. Uno scritto sconosciuto di GALENO sull'empiria della medicina. *Rivista di storia delle scienze* 29, 258-65, 1938. ISIS

Wellmann, Max. MARCELLUS VON SIDE als Arzt und die Koiramiden des Hermes Trismegistos. (*Philologus*. Suppl. H. 2). 50 p. Leipzig, DIETERICH, 1934. ISIS

Withington, E. T. GALEN's anatomy. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 96-100, Antwerp, 1923. ISIS

IIIrd century (whole and first half)

Bhattacharya, V. Mahāyānavimśaka of Nāgārjuna. Reconstructed Sanscrit text, the Tibetan and the Chinese versions with an English translation. IV+44 p. (Visava-Bharati studies, no. 1). Calcutta, Visva-Bharati Bookshop, 1931. ISIS

Butterworth, George William. ORIGEN on first principles. Being KOETSCHAU's text of the " De principiis " translated into English, together with an introduction and notes. XLIII+342 p. London, S. P. C. K., 1936. ISIS

Cadiou, René. Dictionnaires antiques dans l'œuvre d'ORIGÈNE. *Revue des études grecques* 45, 271-85, 1932. ISIS

Decker, Aegidius. Kenntnis und Pflege des Körpers bei CLEMENS VON ALEXANDRIA. 74 p. (Veröff. d. Salzburger-Konföderation d. Benediktiner u. Zisterzienser d. dtsch. Sprachgebietes, Nr. 1). Innsbruck, RAUCH, 1936. ISIS

Mariès, Louis. HIPPOLYTE DE ROME, sur les Bénédictions d'Isaac, de Jacob et de Moïse. Notes sur la tradition manuscrite, texte grec, versions arménienne et géorgienne. 62 p. (Collection d'études anciennes). Paris, Société d'éditions " Les Belles Lettres," 1935. ISIS

Seston, William. Remarques sur le rôle de la pensée d'ORIGÈNE dans les origines du monachisme. *Revue de l'Histoire des Religions* 108, 197-213, 1933. ISIS

Staples, W. E. The second column of ORIGEN's *Hexapla*. *Journal of the American Oriental Society* 59, 71-80, 1939. ISIS

Tucci, Giuseppe. The Ratnāvalī of NĀGĀRJUNA. *Journal of the Royal Asiatic Society*, 307-25, 1934; 423-35, 1936. ISIS

IIIrd century (second half)

Allberry, C. R. C. A Manichaean Psalm-book, part II. With a contribution by HUGO IBSCHER. (Manischaean manuscripts in the Chester Beatty collection, 2). XXIII+234+48 p., 2 pl. Stuttgart, KOHLHAMMER, 1938. ISIS

Cavazzoni, Luigi. Studi su DIOFANTO. *Rendic. Semin. Matem. Roma* 7, 109-73, 1932. ISIS

Henry, Paul (S. J.). PLOTIN et l'Occident. FIRMICUS MATERNUS, MARIUS VICTORINUS, SAINT AUGUSTIN et MACROBE. 291 p. (Univ. catholique de Louvain, Spicilegium sacrum Lovaniense. Études et documents, fasc. 15). Louvain, Spicilegium sacrum Lovaniense, 1934. ISIS

Hopkins, Arthur John. A study of the Kerotakis process as given by ZOSIMUS and later alchemical writers. *Isis* 29, 326-54, 1938. ISIS

Inge, William Ralph. PLOTINUS. *Proceedings of the British Academy* 15, 19-43, 1929. ISIS

Ver Eecke, Paul. Note sur la théorie du plan incliné chez les mathématiciens grecs. *Mathesis* 45, 352-55, 1931. ISIS

Traduction avec notes explicatives de la proposition 9 du livre VIII de " La Collection mathématique " de PAPPUS. J. P.

Zosimos. The visions of ZOSIMOS. Translation and prefatory note by F. SHERWOOD TAYLOR. *Ambix* 1, 88-92, 1937. ISIS

IVth century (whole and first half)

Alföldi, Andrew. A festival of Isis in Rome under the Christian emperors of the IVth century. Being a lecture given at the International congress of the numismatists, London, 1936. 95 p., 20 pl. Budapest, Institute of Numismatics and Archeology of the Pázmány-University, 1937. ISIS

" We know, that the coinage lost its pagan character in the later part of the reign of CONSTANTINE and also, that the mint of Rome followed in

general the same regulations, that were obligatory in the other mints. The more surprising is it, that a festival of Isis and Serapis could continue so ostentatiously to find expression on the long series of numismatic documents. Even if it must be admitted that these occasional issues are carefully distinguished for the most part from the normal issues by metal, size and weight, yet the authentic mark of sovereignty, the imperial portrait, still lent the badge of state authority to a heathen cult till as late a date as 378/379 ! And even when at this moment the rulers declined to tolerate further such an astonishing abuse, they still overlooked for some fifteen years the continuation of this heathen coinage without the portrait of the regents."

Baynes, Norman Hepburn. EUSEBIUS and the Christian Empire. *Mélanges Bidez*, p. 13-18, Bruxelles, 1934. ISIS

Baynes, Norman Hepburn. CONSTANTINE THE GREAT and the Christian Church. 108 p. (Raleigh Lecture on History). *Proceedings of the British Academy* 15, 1930. ISIS

Foakes-Jackson, Frederick John. EUSEBIUS PAMPHILI, Bishop of Caesarea in Palestine and first Christian historian. A study of the man and his writings. Five essays. XVI+153 p. Cambridge, HEFFER, 1933. ISIS

(Gregorius monachus Cyprius). " De theoria sancta " quae Syriace interpretata dicitur visio divina. Syriace edidit, Latine vertit, notis illustravit praefatus est IRENAEUS HAUSHERR S. J. 159 p. (Orientalia Christiana analecta, 110). Rome, Pont. Institutum Orientalium Studiorum, 1937. ISIS

Haefeli, Leo. Stilmittel bei AFRAHAT dem Persischen Weisen. VIII+196 p. (Leipziger Semitistische Studien, 4). Leipzig, HINRICHS, 1932. ISIS

Hamilton, Clarence H. *Wei shih er shih lun.* Or the Treatise in twenty stanzas on representation-only by VASUBANDHU. Translated from the Chinese version of HSÜAN TSANG Tripiṭaka master of the T'ang dynasty. 82 p. (American Oriental series, vol. 13). New Haven, American Oriental Society, 1938. ISIS

This text of VASUBANDHU (for whom see my *Introd.*, vol. 1, 350), " belongs to a late development in the history of Indian Buddhism when interest had shifted from early emphasis on practical requirements for attaining *nirvāṇa* to concern with metaphysical explanation as the superior means for achieving enlightenment. In content it represents the system of Buddhistic idealism which Chinese pilgrims found current in India during the fifth, sixth, and seventh centuries of the Christian era, the period of most active transmission of Buddhist literature to the Far East. Transplanted in China, Japan,

and Tibet, VASUBANDHU's organization of the ideas in two brief but pregnant treatises came to be regarded as a major achievement in rational statement for the highest meaning of Mahāyāna doctrine. This result is owing, in no small degree, to the devotion of HSŪAN TSANG himself to the system. VASUBANDHU's treatise in twenty stanzas, the *Viṃśatikā*, has long been valued as an elementary presentation of his thought. The esteem in which it has been held in China is evidenced by four extant translations." The translation of HSŪAN TSANG (VII-1, *Introd.* 1, 477), upon which HAMILTON based his work, is generally recognized as the best. G. S.

Helm, Rudolf. Die neuesten Hypothesen zu EUSEBIUS' (HIERONYMUS) Chronik. *Sitzb. der preuss. Akad. phil-hist. Kl.* 371-408, 1929. ISIS

Helm, Rudolf. HIERONYMUS' Zusätze in EUSEBIUS' Chronik und ihr Wert für die Literaturgeschichte. 98 p. (*Philologus*. Supplementbd. 21, H. 2). Leipzig, DIETERICH, 1929. ISIS

Heuten, Gilbert. JULIUS FIRMICUS MATERNUS, De errore profanarum religionum. Traduction nouvelle avec texte et commentaire. 213 p. (Travaux de la Faculté de Philosophie et Lettres de l'Université de Bruxelles, 8). Bruxelles, l'Université, 1938. ISIS

(Îśvarakrishna). The *Sāṁkhya Kārikā* of ÎŚVARA KRSNA. With an introduction, translation, and notes by S. S. SURYANARAYANA SASTRI. XLI+130 p., 1 pl. Madras, University of Madras, 1930. ISIS

Jacobi, Hermann. Triṃśikāvijñapti des VASUBANDHU, mit Bhāṣya des ĀCĀRYA STHIRAMATI. Übersetzt von HERMANN JACOBI. Den Druck besorgte WALTER RUBEN. VI+64 p. (Beiträge z. ind. Sprachwiss. u. Religionsgesch. H. 7). Stuttgart, KOHLHAMMER, 1932. ISIS

La Vallée Poussin, Louis de. L'Abhidharmakosa de VASUBANDHU. In six vols. (Société Belge d'Études Orientales). Paris, GEUTHNER, 1923-1931. ISIS

Elaborate review by E. H. JOHNSTON, *Journal of the Royal Asiatic Society* 611-17, 1934.

Puech, Aimé. Histoire de la littérature grecque chrétienne depuis les origines jusqu'à la fin du IV^e^ siècle, t. III : Le IV^e^ siècle. 693 p. Paris, Les Belles Lettres, 1930. ISIS

Rolleston, J. D. ST. BLAISE, physician and martyr. *VI^e^ Congrès international d'histoire de la médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 114-19, Anvers, 1929. ISIS

Sévilla, H. J. L'Hippiatrique byzantine du IVe siècle. Ses sources orientales. *Ve congrès international d'histoire de la médecine*, Genève, 1925, p. 234-42, Genève, 1926. ISIS

"L'esprit de celui qui scrute les textes médico-vétérinaires byzantins est continuellement hanté par les civilisations de la Grèce, de l'Égypte et de Babylone. Sous la plume d'APSYRTE renaissent les méthodes thérapeutiques des Sarmates, les coutumes des habitants de la Cappadoce et de la Syrie, sous celle de THÉOMNESTE les inventions des Arméniens. La rédaction des recettes, les notations numériques des formules, l'archaïsme des mesures pondérales et de volume ressuscitent, au milieu des écrits du quatrième siècle, des connaissances médicales antiques."

Svennung, J. Untersuchungen zu PALLADIUS und zur lateinischen Fach- und Volkssprache. XXX+698 p. (Arbeten utgivna med understöd av Vilhelm Ekmans Universitetsfond, Uppsala, 44). Lund, BLOM, 1935. ISIS

IVth century (second half)

Baur, P. Chrysostomus. Der heilige JOHANNES CHRYSOSTOMUS und seine Zeit. 1. Bd. : Antiochien. 2. Bd. : Konstantinopel. XL+330 p. ; 411 p., 2 maps. München, HUEBER, 1929-30. ISIS

Corte, Marcel de. THEMISTIUS et SAINT THOMAS D'AQUIN. *Archives d'histoire doctrinales et littéraires du moyen âge* 7, 47-83, 1932. ISIS

Dedering, Sven. JOHANNES VON LYKOPOLIS. Ein Dialog über die Seele und die Affekte des Menschen. XXXII+93 p. Leipzig, HARRASSOWITZ, 1936. ISIS

Dudden, Frederick Homes. The life and times of ST. AMBROSE. 2 volumes. X+370 p. ; 371-755. New York, Oxford University Press, 1935. ISIS

Fargues, Pierre. CLAUDIEN, études sur sa poésie et son temps. 344 p. Paris, 1933. ISIS

Gollancz, Sir Hermann (1852-1930). JULIAN THE APOSTATE. Now translated for the first time from the Syriac original (the only known manuscript in the British Museum, edited by HOFFMANN of Kiel). 264 p. Oxford University Press, 1928. ISIS

This is the Syriac romance of JULIAN. G. S.

Köstermann, Erich. Zum Quellenproblem in AVIENS Ora maritima. *Hermes* 68, 472-75, 1933. ISIS

Monceaux, Paul. SAINT JÉRÔME. Sa jeunesse. L'étudiant et l'ermite. XXX+240 p. (La vie chrétienne). Paris, GRASSET, 1932. ISIS

Murphy, Sister Margaret Gertrude. ST. BASIL and monasticism. XIX+112 p. (Catholic University of America Patristic Series, XV). Washington, Catholic University of America, 1930. ISIS

(Oribasius). Collectionum medicarum reliquiae. Vol. IV, Libri XLIX-L. Libri incerti. Eclogae medicamentorum. Index, edidit JOANNES RAEDER. (Kopenhagen). XI+335 p. (Corpus medicorum Graecorum auspiciis Academiarum associatarum ediderunt Academiae Berolinensis, Havniensis, Lipsiensis, 6). Leipzig, TEUBNER, 1933. ISIS

Palanque, Jean-Rémy. SAINT AMBROISE et l'Empire romain. Contribution à l'histoire des rapports de l'Église et de l'État à la fin du quatrième siècle. XVI+599 p. Paris, DE BOCCARD, 1933. ISIS

(Sallustius, S. S.). SALLUSTE le philosophe. Des dieux et du monde. Traduction nouvelle avec prolégomènes et notes par MARIO MEUNIER. 190 p. Paris, Éditions Véga, s.d. (1931). ISIS

Schöne, Hermann. *Περὶ ὑγιεινῆς ἀναφωνήσεως* bei ORIBASIUS. Collec. med. VI, 10. *Hermes* 65, 92-105, 1930. ISIS

(Theodore of Mopsuestia). Commentary of THEODORE OF MOPSUESTIA on the Nicene creed. VIII+240 p. (Woodbrooke Studies. Christian documents in Syriac, Arabic, and Garshuni, edited and translated with a critical apparatus by A. MINGANA. Vol. 5). Cambridge, HEFFER, 1932. ISIS

Tucci, Giuseppe. The *Nyāyamukha* of DIGNĀGA. The oldest Buddhist text on logic after Chinese and Tibetan materials. 72 p. (Materialien zur Kunde des Buddhismus, hrsg. v. M. WALLESER, 15). Heidelberg, HARRASSOWITZ, 1930. ISIS

Svennung, Josef. Wortstudien zu den spätlateinischen Oribasiusrezensionen. (Uppsala Univ. Arsskrift, Språkvet Sällsk. Förhandl. 1931-1933, 57-146). Uppsala, ALMQVIST & WIKSELL, 1932. ISIS

Vth century (whole and first half)

Ardill, John Roche. ST. PATRICK, A.D. 180. IX+221 p. London, MURRAY, 1931. ISIS

Delahaye, Karl. Die 'memoria interior'—Lehre des heiligen AUGUSTINUS und der Begriff der transszendentalen Apperzeption KANTS. Versuch eines historisch-systematischen Vergleichs. XV+166 p. (Abh. z. Philos. u. Psychol. d. Religion, 38-39). Würzburg, BECKER, 1936. ISIS

Harnack, Adolf v. POSSIDIUS AUGUSTINS Leben. Eingeleitet und übersetzt. *Abhdlg. der preuss. Akad. d. Wiss., phil.-hist. Kl.*, Nr. 1, 48 p., 1930. SIIS

Lietzmann, Hans. Zur Entstehungsgeschichte der Briefsammlung AUGUSTINS. *Sitzb. der preuss. Akad. phil.-hist. Kl.* 356-88, 1930. ISIS

Marrou, Henri-Irénée. SAINT AUGUSTIN et la fin de la culture antique. XVI+621 p. Paris, DE BOCCARD, 1937. ISIS

Morgan, James. The psychological teaching of ST. AUGUSTINE. VII+264 p. London, STOCK, 1932. ISIS

Nobel, Johannes. KUMĀRAJĪVA. *Sitzb. der preuss. Akad. phil.-hist. Kl.* 206-33, 1927. ISIS

Peeters, Paul. A propos de la version arménienne de l'historien SOCRATE. *Mélanges Bidez*, p. 647-75, Bruxelles, 1934. ISIS

Peeters, Paul. Pour l'histoire des origines de l'alphabet arménien. *Revue des études arméniennes* 9, 203-37, 1929. ISIS

"L'alphabet arménien a été créé sur plan débattu, par des auteurs connus, à une époque et dans un milieu déterminés, et pour servir à des fins religieuses et surtout ethniques de la plus transparente évidence."

Pickman, Edward Motley. The mind of Latin Christendom. IX+738 p. New York, Oxford University Press, 1937. ISIS

Reviewed by ROBERT S. WOODBURY, *Isis* 29, 428-30, 1938.

Raymond, Irving Woodworth. Seven books of history against the

pagans : the apology of PAULUS OROSIUS. Translated with introduction and notes. IX+436 p. (Records of Civilization). New York, Columbia University Press, 1936. ISIS

Ritter, Joachim. Mundus intelligibilis. Eine Untersuchung zur Aufnahme und Umwandlung der neuplatonischen Ontologie bei AUGUSTINUS. 159 p. (Philos. Abhandlgn. 6). Frankfurt a.M., KLOSTERMANN, 1937. ISIS

(Synesius). The essays and hymns of SYNESIUS OF CYRENE, including the Address to the EMPEROR ARCADIUS and the political speeches. Translated into English with introduction and notes by AUGUSTINE FITZGERALD. Two volumes. Vol. 1, X+241 p.; Vol. 2, VIII+ p. 243-498. Oxford, University Press, 1930. ISIS

Vietmeier, Karl. Beobachtungen über CAELIUS AURELIANUS als Übersetzer medizinischer Fachausdrücke verlorener griechischer Schriften des methodischen Arztes SORANOS VON EPHESOS. Med. Diss. Münster, VIII+111 p. 1937. ISIS

Woolley, Leonard. La visite d'OLYMPIODORE à la forteresse de Karanog. *Chronique d'Égypte* 14, 62-68, 1939. ISIS

Vth century (second half)

Bömer, Franz. Der lateinische Neuplatonismus und Neupythagoreismus und CLAUDIANUS MAMERTUS in Sprache und Philosophie. X+181 p. (Klassisch-philologische Studien, 7). Leipzig, HARRASSOWITZ, 1936. ISIS

Datta, Bibhutibhusan. ELDER ĀRYABHAṬA'S rule for the solution of indeterminate equations of the first degree. *Bull. Calc. Math. Soc.*, 24, 19-36, 1932. ISIS

(Proclus). The elements of theology. A revised text with translation, introduction and commentary, by ERIC ROBINSON DODDS. XLVII+ 340 p. Oxford, Clarendon Press, 1933. ISIS

Reviewed by GEORGE SARTON, *Isis* 29, 423-28, 1938.

Stein, J. Le date della nascita e della morte del filosofo PROCLO. *Memorie della Società Astronomica Italiana*, XI-3, Specola Vaticana Communicatione no. 9, 1938. ISIS

Conclusion : PROCLUS was born in Byzantium on February 8, 412 A.D., and died in Athens on April 17, 485. D. N.

VIth century (whole and first half)

Buberl, Paul. Die antiken Grundlagen der Miniaturen des Wiener Dioskuridescodex. *Jahrbuch des Deutschen archäologischen Instituts* 51, 24 p., 1936. ISIS

Capparoni, Pietro. Una copia delle scene raffiguranti l'estrazione della Mandragora, che ornavano il codice così detto : " DIOSCORIDE di JULIANA ANICIA," da lungo tempo scomparse. *Atti e mem. accademia arte sanit.*, S. 2, a. 2, 301-11, 1936. ISIS

Chapman, John (1865-1933). SAINT BENEDICT and the sixth century. VI+239 p. New York, LONGMANS, GREEN, 1929. ISIS

Darmstaedter, Ernst. ANTHEMIOS und sein " künstliches Erdbeben " in Byzanz. *Philologus* 88, 477-82, 1933. ISIS

Duckett, Eleanor Shipley. The gateway to the Middle Ages. XII+620 p. New York, MACMILLAN, 1938. ISIS

Patch, Howard Rollin. The tradition of BOETHIUS, a study of his importance in mediaeval culture. VIII+200 p., 7 pl. New York, Oxford University Press, 1935. ISIS

Sanda, A. SEVERI Antijulianistica. Quae ex manuscriptis Vaticanis et Britannicis syriace edidit et latine interpretatus est. 470 p. Beryti Phoeniciorum, Typogr. catholica, 1931. ISIS

Schurr, Viktor. Die Trinitätslehre des BOETHIUS im Lichte der " skythischen Kontroversen." XXX+248 p. Paderborn, SCHÖNINGH, 1935. ISIS

Silk, Edmund Taite. Saeculi noni auctoris in BOETII *Consolationem philosophiae* commentarius. LXI+349 p. (Papers and monographs of the American Academy in Rome). Rome, the Academy, 1935. ISIS

Zaloziecky, Wladimir R. Die Sophienkirche in Konstantinopel und ihre Stellung in der Geschichte der abendländischen Architektur. VIII+271 p., fig. 24 pl. (Studi di antichità cristiana, 12). Rome, Pont. Ist. di archeol. crist., 1936. ISIS

VIth century (second half)

Cernousov, E. Études sur MALALAS. Époque d'ANASTASE DICOROS. *Byzantion* 3, 65-72, 1927. ISIS

Christensen, Arthur. La légende du sage BUZURJMIHR. *Acta orientalia* 8, 81-128, 1930. ISIS

Comparetti, D. PROCOPIO di Cesarea, Le inedite, libro nono delle Istorie. Testo greco con traduzione italiana. Edizione postuma licenziata da D. BASSI. LXXX+367 p. (Fonti per la storia d'Italia pubblicate dall' Istituto Storico italiano. Scrittori : secolo VI). Rome, 1928. ISIS

Hennig, Richard. Die Einführung der Seidenraupenzucht ins Byzantinerreich. Eine Studie zur Aufklärung der Unklarheiten in den überlieferten Berichten. *Byzantinische Zeitschrift* 33, 295-312, 1933. ISIS

VIIth century (whole and first half)

Boodberg, Peter A. THEOPHYLACTUS SIMOCATTA on China. *Harvard Journal of Asiatic Studies* 3, 223-43, 1938. ISIS

Fitzgerald, C. P. Son of heaven. A biography of LI SHIH-MIN (597-649) founder of the T'ang Dynasty. IX+6+232 p. Cambridge University Press, 1933. ISIS

Jeanselme, E. Histoire pathologique de la dynastie d'HÉRACLIUS. *Comptes-rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 5-21, Anvers, 1927. ISIS

La Vallée Poussin, Louis de. VASU-BANDHU... Vijñaptimātratāsiddhi, la Siddhi de HIUAN-TSANG. Traduite et annotée. 820 p. (Issued with indexes as vol. I-III, but forming one vol.). Paris, GEUTHNER, 1928-9. ISIS

Nykl, A. R. Notes on E. H. PALMER's " The Qur'ān." *Journal of the American Oriental Society* 56, 77-84, 1936. ISIS

Oliaro, Tomaso. La medicina nelle opere di ISIDORUS HISPALENSIS e nel codice " ISIDORUS et ali de medicina ". Torino, *Minerva Medica*, 1935 ISIS

Reviewed by G. VERITÀ, *Rivista di storia delle scienze mediche* 27, 210, 1936.

Séjourné, Dom Paul. Le dernier père de l'église, SAINT ISIDORE DE SÉVILLE. Son rôle dans l'histoire du droit canonique. 535 p. Paris, BEAUCHESNE, 1929. ISIS

Stcherbatsky, Th. Buddhist logic. Vol. 2, containing a translation of the short treatise of logic by DHARMAKĪRTI and of its commentary by DHARMOTTARA, with notes, appendices and indices. VI+468 p. (Bibl. Buddhica, 26). Leningrad, Ac. des Sc., 1930. ISIS

VIIth century (second half)

(Cassiodorus). CASSIODORI senatoris institutiones. Edited from the manuscripts by R. A. B. MYNORS. 193 p. Oxford, Clarendon Press, 1937. ISIS

Furlani, Giuseppe. Il primo libro dei Primi Analitici di ARISTOTELE nella versione siriaca di GIORGIO DELLE NAZIONI. 88 p. (Reale Accademia nazionale dei Lincei anno CCCXXXII-1935, serie VI, vol. 5, fasc. III). Rome, BARDI, 1935. ISIS

Furlani, Giuseppe. Il secondo libro dei Primi Analitici di ARISTOTELE nella versione siriaca di GIORGIO DELLE NAZIONI. II+57 p. (Reale accademia nazionale dei Lincei, 6). Rome, BARDI, 1937. ISIS

Girvan, Ritchie. BEOWULF and the seventh century; language and content. VIII+86 p. London, METHUEN, 1935. ISIS

el-Hawary, Hassan Mohammed. The second oldest Islamic monument known, dated A.H. 71 (A.D. 691). From the time of the Omayyad Calif 'ABD-EL-MALIK IBN MARWĀN. *Journal of the Royal Asiatic Society*, 289-93, 1 pl., 1932. ISIS

Lin Li-Kouang. PUṆYODAYA (NA-T'I), Un propagateur du Tantrisme en Chine et au Cambodge à l'époque de HIUAN-TSANG. *Journal asiatique* 227, 83-100, 1935 (received March 1936). ISIS

Mingana, Alphonse. Woodbrooke studies, vol. 7. Early Christian mystics. VI+320 p. Cambridge, HEFFER, 1934. ISIS

VIIIth century (second half)

McGeachy, J. A., jr. The *Glossarium Salomonis* and its relationship to the *Liber glossarum*. *Speculum* 13, 309-18, 1938. ISIS

"A comparison of glosses from the *Liber Glossarum* (*Parisinus*, B. N.,

11529-30), the Munich manuscript of the *Liber Glossarum* (*Monacensis*, 14429), and the *Glossarium Salomonis* (*Sangallensis* 905), permits two conclusions to be drawn. In the first place, the close correspondence between the *Glossarium Salomonis* and the *Liber Glossarum* shows that the manuscript of the *Liber Glossarum* from which the St. Gall scholars drew their material was a very complete one. The *Glossarium Salomonis* is a very full copy, in which adherence to alphabetical order is rather accurately maintained; therefore, it hardly deserves the somewhat derogatory designation ' epitome.' Such a view suggests that the *Glossarium Salomonis* is of more value in the study of the *Liber Glossarum* than scholars have been accustomed to think, and that it is deserving of more attention than it has received. In the second place, it is evident that the Munich manuscript cannot have been the source of the *Glossarium Salomonis*. The omissions and abbreviations in the text of the former make such a thing impossible. From some manuscript of the *Liber Glossarum* unknown to us, the compilers of the *Glossarium Salomonis* drew their material, adhering much more closely to the original work than the Munich copy does. What manuscript this may have been is an interesting and unsolved question. Did the library of St. Gall possess a copy of the *Liber Glossarum?* The ninth-century catalogue of the library lists *Libri Glosarium* volumina VIII. It would be interesting to know just what these eight *glossaria* were. May we venture the opinion that among them were the *Liber Glossarum* and the *Abavus Major*, and that these manuscripts were the sources of the *Glossarium Salomonis?*"

IXth century (whole and first half)

Gandz, Solomon. The algebra of inheritance. A rehabilitation of AL-KHUWĀRIZMĪ. *Osiris* V, 319-91, 1938. ISIS

Fundamental study wherein AL-KHUWĀRIZMĪ's problems are completely discussed. The result is a revaluation of the great Arabic mathematician against his early editor FRIEDRICH ROSEN (London, 1831). G. S.

Lichtenstädter, Ilse. MUḤAMMAD IBN ḤABĪB and his *Kitāb al-Muḥabbar*. *Journal of the Royal Asiatic Society* 1-27, 1939. ISIS

" The *Kitāb al-muḥabbar* gives information on a great variety of subjects. Beginning with a survey of the history of the world it soon turns to events nearer to an Arab's interest, the history of the Arabian Peninsula before and after the advent of MUḤAMMAD. The author's principal endeavour in the book, however, is not to give the full report of the events, but to give a skeleton account of them laying emphasis on the collection of facts rather than relating the course of the events. Thus the book contains a great number of lists."

IXth century (second half)

Arberry, A. J. The book of truthfulness (*Kitāb al-ṣidq*) by ABŪ

SA'DĪ AL-KHARRĀZ. VII+70+83 p. (Islamic Research Association. 6). London, MILFORD, 1937. ISIS

Reviewed by MARGARET SMITH, *Journal of the Royal Asiatic Society* 627-28, 1938.

Robson, James. Ancient Arabian musical instruments. As described by AL-MUFAḌḌAL IBN SALAMA (9th century) in the unique Istanbul manuscript of the *Kitāb al-malāhī* in the handwriting of YĀQŪT AL-MUSTA'ṢIMĪ (d. 1298). Text in facsimile and translation edited with notes. Including notes on the instruments by HENRY GEORGE FARMER. 20 p., 23 pl. (Collection of Oriental Writers on Music, 4). Glasgow, Civic Press, 1938. ISIS

Édition de luxe of an old Arabic musical text, with translation, elaborate preface and archaeological notes. G. S.

Sbath, Paul ; Meyerhof, Max. Le livre des questions sur l'œil de ḤONAIN IBN ISḤĀQ. *Mémoires présentés à l'Institut d'Égypte*, 36, 147 p. Le Caire, Imprimerie de l'Institut français d'archéologie orientale, 1938. ISIS

Reviewed in *Isis* 29, 430, 1938. Correction to that review. The Arabic text was edited by SBATH; the translation was made by MEYERHOF, who also compiled the indices and glossaries. G. S.

Schloessinger, Max. The *Ansāb al-ashrāf* of AL-BALĀDHURĪ. Published for the first time by the School of oriental studies, Hebrew University, Jerusalem, volume IV B. 2 vols. Jerusalem, University Press, 1938. ISIS

BALĀDHURĪ's work and the great undertaking of the Hebrew University were discussed (*Isis* 26, 457-8) when the first instalment was edited by S. D. F. GOITEIN (1936). "The text herewith presented, volume IV B of BALĀDHURĪ's *Ansāb al-ashrāf*, deals with the second Omayyad Caliph, YAZĪD IBN MU'ĀWIYA, and his family. It contains a good deal of hitherto unknown material concerning this Caliph and the poems ascribed to him. The most decisive events of his reign, the battle of Kerbela and ḤUSAIN's death, are, however, not recorded by BALĀDHURĪ in YAZĪD's biography, but in the chapters dealing with the family of ABŪ ṬĀLIB which accords with the genealogical arrangement of the book. It further deals with the descendants of ZIYĀD IBN ABĪ SUFYĀN, more commonly known as ZIYĀD IBN ABĪHI, and at greater length with ZIYĀD's most important son, 'UBAID ALLĀH. We learn of many hitherto unknown incidents in the latter's persecutions of the Khawārij. It would seem that BALĀDHURĪ used a Khawārij historical source lost to us. Or it may well be, as S. D. F. GOITEIN suggests, that BALĀDHURĪ himself had originally intended to write a comprehensive monograph on the Khawārij movement and used his material in the *Ansāb*." The work has been done with loving care and the printing is beautiful. Congratulations to the editor and to the University for their faith and perseverance in these dark days. G. S.

Villaret, Maurice ; Hariz, Joseph. Le millénaire de RHAZIS (AR-RAZI). *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 265-66, Antwerp, 1923. ISIS

Xth century (whole and first half)

Bédoret, H. (S. J.). L'auteur et le traducteur du *Liber de causis*. *Revue néoscolastique de philosophie* 41, 519-33, 1938. ISIS

Interesting study to the continuation of which we shall look forward. The author concludes : " Il reste très probable que le *Liber de causis*, identique au *Liber Aristotelis de expositione bonitatis purae* traduit d'arabe en latin par GÉRARD DE CRÉMONE, est l'œuvre d'ALFARABI, et que ce dernier a utilisé l'*Elementatio theologica* de PROCLUS se présentant à lui comme un écrit d'ARISTOTE. La thèse de BARDENHEWER est ainsi confirmée et précisée..." For a parallel discussion apropos of the traditions of PROCLOS' metaphysics see *Isis* 29, 426, 1938. G. S.

Xth century (second half)

Kross, Solomon L. The Hebrew-Arabic dictionary of the Bible known as *Kitāb jāmiʿ al-alfāz* (*Agron*) of DAVID BEN ABRAHAM AL-FĀSĪ (tenth century). Vol. I. CLI+600 p. (Yale University series, researches, 20). New Haven, Yale University Press, 1936. ISIS

Reviewed by D. S. MARGOLIUOTH, *Journal of the Royal Asiatic Society* 464-65, 1938. This volume deals with eight letters of the alphabet.

XIth century (whole and first half)

Capparoni, Pietro. Un code du " De quattuor humoribus corporis humani" d'ALFANUS, Archevèque de Salerno (siècle XI). *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 52-58, Anvers, 1929. ISIS

Davis, Tenney L. ; Yün-Ts'ung, Chao. CHANG PO-TUAN, Chinese alchemist of the eleventh century. *Journal of chemical education* 16, 53-57, figs., 1939. ISIS

(Firdawsi). FIRDOUSI celebration, 935-1935, Addresses delivered at the celebration of the thousandth anniversary of the birth of the national poet of Iran held at Columbia University and the Metropolitan Museum of Art in the City of New York. A bibliography of the principal manuscripts and printed editions of the *Shāh-nāmah* in

certain leading public libraries of the world. Edited by DAVID EUGENE SMITH. XIII+138 p., fig. New York, MCFARLANE, WARDE, MCFARLANE, 1936. ISIS

Reviewed by LUCIEN BOUVAT, *Journal asiatique* 229, 666, 1937 (received Jan. 1939). Not seen. G. S.

Meyerhof, M.; Joannides, D. La gynécologie et l'obstétrique chez AVICENNE (IBN SINA) et leurs rapports avec celles des Grecs. 80 p., 6 pl. (Hôpital Papayoannou, section d'obstétrique). Le Caire, SCHINDLER, 1938. ISIS

Sarton, George. The tradition of the optics of IBN AL-HAITHAM. Query no. 76. *Isis* 29, 403-06, 2 fig., 1938. ISIS

Zaki-Ali, Dr. Neuvième centenaire d'AVICENNE " prince des Médecins." *Bulletin de la Société française d'histoire de la médecine* 32, 215-21, 1938. ISIS

XIth century (second half)

Van Gulik, R. H. MI FU on ink-stones. Translated by R. H. VAN GULIK, with an introduction and notes. XII+70 p. Peking, VETCH, 1938. ISIS

" This monograph on MI FU (1051-1107) and his treatise on ink-stones does not pretend to be anything more than a preliminary study of the subject. To my translation of his *Yen-shih*, ' An account of ink-stones ' (chapter III), I have added a survey of his literary activities, a list of some secondary sources of information relating to him (chapter I), and a few remarks on the Chinese ink-slab, in general (chapter II). Lastly, in chapter IV, I have attempted to draw some general conclusions from these materials, and particularly from the *Yen-shih*. The field of Chinese literature is so vast that a first attempt to collect data on any subject must needs remain incomplete. MI FU, however, occupies such a prominent place in the history of Chinese pictorial art, that I feel justified in venturing to publish the result of my investigations."

XIIth century (whole and first half)

Faraj, Abdalmalik. Relations médicales hispano-maghrébines au XII^e siècle. 68 p. (Faculté de médecine de Paris, thèse). Paris, Véga, 1935. ISIS

" Le présent travail a pour objet les relations médicales entre l'Espagne et le Maroc au moment où les deux pays étaient sous la même domination. Il jettera peut-être quelque lumière sur les causes qui ont déterminé l'arrêt

des études médicales en Occident musulman. Nous nous limiterons au XII[e] siècle." ... " Nous donnerons en appendice quelques extraits du *Taysir* et de l'*Iqtiçad* d'AVENZOAR, qui nous paraissent donner quelques lumières sur les mœurs médicales du XII[e] siècle." Voir compte rendu par H. P. J. RENAUD : *Bull. Soc. franç. hist. méd.* (vol. 32, 123-25, 1938). G. S.

Kantorowicz, Hermann. Studies in the glossators of the Roman law : newly discovered writings of the twelfth century, edited and explained... with the collaboration of W. W. BUCKLAND. XVIII+324 p. Cambridge University Press, 1938. ISIS

Renaud, H. P. J. Étude sur le *Musta 'ini* d'IBN BEKLÀRECH, médecin juif de Saragosse au XI[e] siècle. *VI[e] Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 267-73, Anvers, 1929. ISIS

Apropos of YŪSUF IBN ISḤĀQ IBN BIKLĀRISH (*Intr.* 2, 235). G. S.

Ruska, Julius ; Hofmann, Jos. E. Sopra un problema di geometria elementare in ABUL-FUTUH. *Bollettino di matematica* 35, *sezione stor. bib.*, i-ii, 1939. ISIS

Apropos of ABŪ-L-FUTŪḤ AḤMAD IBN MUḤAMMAD IBN AL-SURĀ, deliberately omitted in my *Introduction* because of the lack of information (SUTER no. 287, p. 120). G. S.

XIIth century (second half)

Gaselee, Stephen. Notes on the vacabulary of ALEXANDER NECKAM. *Speculum* 14, 106-07, 1939. ISIS

Gauthier, Léon. *Hayy ben Yaqdhān*, roman philosophique d'IBN THOFAÏL. Texte arabe, avec les variantes des manuscrits et de plusieurs éditions, et traduction française. 2[e] édition, revue, augmentée et complètement remaniée par LÉON GAUTHIER. XXXIV+193 p. ; 188 p. in Arabic. (Institut d'études orientales de la Faculté des lettres d'Alger, 3). Beyrouth, Imprimerie Catholique, 1936. (La date de publication n'est vraie que pour l'introduction ; la publication n'a été complétée qu'en 1937, ou avant avril 1938). ISIS

Reviewed by GEORGE SARTON, *Isis* 30, 100-03, 1939.

Morey, Dom Adrian. BARTHOLOMEW OF EXETER, bishop and canonist : a study in the twelfth century, with the text of BARTHOLOMEW's Penitential from the Cotton Ms. (VITELIUS A. XII). XI+320 p. Cambridge University Press, 1937. ISIS

Pines, S. Études sur AWḤAD AL-ZAMĀN ABŪ'L BARAKĀT AL-BAGHDĀDĪ. *Revue des Études Juives*, vol. 104, 95 p., 1938. ISIS

L'auteur continue ses recherches importantes sur HIBATALLĀH IBN MALKĀ (*Introd.* 2, 382) dont la première partie a paru dans *Archeion* (21, 298-306; *Isis* 31, 226). " Les deux études qui sont publiées ici ont eu pour but de relever quelques-unes des conceptions les plus significatives exposées dans la Physique du *K. al-mu'tabar*, d'en montrer la filiation, et parfois l'originalité. J'ai dû insister notamment sur la critique à laquelle ABŪ'L-BARAKĀT soumet les doctrines aristotéliciennes ; soit qu'il reprenne, pour la développer et la modifier, la théorie avicennienne du *mayl qasrī*, soit qu'il élabore des opinions platoniciennes, stoïciennes, atomistes, philoponiennes, à l'aide desquelles il opère, par ses doctrines du vide et de l'infini, et sur un autre plan par ses considérations sur les mouvements naturels, la dislocation du cosmos d'ARISTOTE. Le domaine qui a été exploré est trop restreint pour autoriser un jugement sur la véritable stature philosophique d'ABŪ'L-BARAKĀT et sur la portée de son système; cela exigerait un examen bien plus étendu de son œuvre. Les études qui suivront s'appliqueront à cette tâche." G. S.

XIIIth century (whole and first half)

Bennett, Ralph Francis. The early Dominicans ; studies in thirteenth-century Dominican history. XII+189 p. (Cambridge studies in medieval life and thought). Cambridge University Press, 1937. ISIS

De Mets. Organisation du service médical de nos anciennes milices flamandes du treizième siècle. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 84-5, Anvers, 1927. ISIS

Garosi, A. Considerazioni sul testamento di un medico del Dugento. *Rivista di storia delle scienze mediche* 29, 205-15, 1938. ISIS

Mandonnet, Pierre Félix (1858-1936). SAINT DOMINIQUE : l'idée, l'homme et l'œuvre. T. I, Étapes. Augmenté de notes et d'études critiques par M. H. VICAIRE. T. II, Perspectives. Augmenté de notes et d'études critiques par M. H. VICAIRE et R. LADNER. 280 p. ; 321 p. Paris, DE BROUWER, 1938. ISIS

Read, John. MICHAEL SCOT : a Scottish pioneer of science. *Scientia* 32, 190-97, 1938. ISIS

Thomson, S. Harrison. The texts of MICHAEL SCOT's *Ars Alchemie*. *Osiris* V, 523-59, 1938. ISIS

Description and edition of the three divergent texts (Palermo, Oxford,

Cambridge) with notes and discussion. Says the editor "of the three I believe the Palermo text is closest to MICHAEL, though it was written at least a quarter century later than the two English copies. The scribe knew more about the subject than the English scribes and wrote much more accurately. The least well informed scribe wrote the Cambridge copy, perhaps the earliest in point of actual writing. The juxtaposed texts will suggest some observations as to possible relationships between them which will be found after the body of the text."

Uṣaibi'a, Ibn abî (*Introd.* 2, 685). The two editors IMRU-L-QAIS IBN AL-ṬAḤḤAN and AUGUST MÜLLER are the same person. IBN AL-ṬAḤḤAN is a translation of MÜLLER, and IMRU-L-QAIS an allusion to the author's doctoral thesis on that famous poet. This explains the remark which SARTON made apropos of the two editions.
(*Leningrad*). IGN. KRATCHKOVSKY. ISIS

Vernadsky, George. The scope and contents of CHINGIS KHAN's *Yasa*. *Harvard Journal of Asiatic Studies* 3, 337-60, 1 pl., 1938. ISIS

Wickersheimer, Ernest. ROBERT GROSSETESTE et la médecine. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 259-62, 1 pl., Antwerp, 1923. ISIS

XIIIth century (second half)

Capparoni, Pietro. Commentaires sur une rare traduction italienne du XIV^e^ siècle du "Thesaurus Pauperum" de PIERRE ISPANUS. *VI^e^ Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 309-12, Anvers, 1929. ISIS

Juwaynī, 'Alā-ud-Dīn Aṭā Malik-i. The Ta'rikh-i-Jahān-Gushā (Composed in A.H. 658 = A.D. 1260). Part III : Containing the History of Mangū Qā'ān, Hūlāgū and the Ismā'īlīs. Edited with an introduction, notes and indices from several old MSS by MĪRZĀ MUḤAMMAD IBN 'ABDU L-WAHHĀB-I-QAZWĪNĪ and printed for Trustees of the E. J. W. Gibb Memorial. Volume 16, 3. XV+592 p., 4 pl. Leyden, BRILL, Imprimerie Orientale, 1937. ISIS

Keyser, Cassius Jackson. ROGER BACON. *Scripta Mathematica* 5, 177-80, 1938. ISIS

Kuwabara, Jitsizō. *Tō Sō jidai ni okeru Arab-jin no Shina Tsūshō*

no gaikyō; *kotoni Sō matsu no Teikyo-shihaku Saiiki-jin Ho Ju-kō no jiseki* (P'U SHOU-KĒNG, a man of the Western regions, who was superintendent of the trading ships' office in Ch-üan-chou towards the end of the Sung dynasty, together with a general sketch of trade of the Arabs in China during the T'ang and Sung eras). 267 p., map. Tokyo, IWANAMI, 1935. ISIS

Reviewed by SHIO SAKANISHI, *Isis* 30, 120-21, 1939.

Moule, A. C.; Pelliot, Paul. MARCO POLO : the description of the world. Vol. II, London, ROUTLEDGE, 1938 (to consist of four volumes, 1300 p., 80 pl. Sold only in complete sets at 6 guineas net. Edition limited to 450 sets. The acceptance of volume II, which is published first, binds the purchaser to accept the other three volumes when published.) ISIS

Reviewed by DANA B. DURAND, *Isis* 30, 103-09, 1939.

Penzer, N. M. The most noble and famous travels of MARCO POLO together with the travels of NICOLO DE' CONTI. Edited from the Elizabethan translation of JOHN FRAMPTON. LXIV+381 p., 11 maps. London, BLACK, 1937. ISIS

Robertson, W. G. Aitchison. An early hygienist : ALDERBRANDINO. *Ve Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 199-201, Genève, 1926. ISIS

Van Steenberghen, Fernand. Les œuvres et la doctrine de SIGER DE BRABANT. *Acad. r. de Belg. Classe des Lettres, Mém. collection* in-8°, 39, 195 p., 1938. ISIS

Vincent of Beauvais. De eruditione filiorum nobilium. Edited by ARPAD STEINER. XXXII+236 p. Cambridge, Mass., Mediaeval Academy of America (pub. no. 32), 1938. ISIS

Critical edition of that important treatise (*Intr.* 2, 931) together with a study of its sources, etc. G. S.

Woodruff, F. Winthrop. ROGER BACON, a biography. 150 p., London, CLARKE, 1938. ISIS

This is a popular, but critical, biography stressing BACON's criticisms of the schoolmen, his reputation as astrologer and magician, his discoveries and inventions, and the modernity of his concept of the scientific method and its importance. C. A. K.

XIVth century (whole and first half)

Coleman, T. W. English mystics of the fourteenth century. London, Epworth Press, 1938. ISIS

Fosseyeux, Marcel. DANTE et la médecine de son temps. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 275-81, Évreux, 1922. ISIS

Ibach, Helmut. Leben und Schriften des KONRAD VON MEGENBERG. 185 p. (*Neue Deutsche Forschungen*, 210). Berlin, DÜNNHAUPT, 1938 (RM. 8). ISIS

Elaborate study of MEGENBERG's life and writings. The author has attached special importance to the study of MEGENBERG's political ideas, his conception of a Christian order, wherein the Germans take the first place; he even speaks of a "germanicus ordo." He gives a chronological list of the 28 writings correctly ascribed to MEGENBERG, ranging from the *Planctus ecclesiae in Germaniam* 1337/38 to 1373. In that list the *Deutsche sphaera* is dated 1347/50, the *Buch der Natur* 1350, the *Oeconomica* 1354. G. S.

Levy, Reuben. The *Ma'ālim al-qurba fī aḥkām al-ḥisba* of ḌIYĀ' AL-DĪN MUḤAMMAD IBN MUḤAMMAD AL-QURASHI AL-SHĀFI'Ī known as IBN AL-UKHUWWA. Edited, with abstract of contents, glossary and indices. XVII+113+ (237 p. in Arabic). ("E. J. W. GIBB memorial" series, 12). London, printed by Cambridge University Press for the trustees of the E. J. W. Gibb memorial, 1938. ISIS

I have already had the opportunity of dealing with two works of the same kind. One by 'ABD AL-RAḤMĀN IBN NAṢR, the *Nihāyat al-rutbat* analyzed by WALTER BEHRNAUER in 1860-61 (*Introd.* 2, 463) and the treatise of IBN 'ABDŪN edited by LÉVI-PROVENÇAL in 1934 (*Isis* 24, 200). The first author was an Egyptian who flourished in SALADIN's time (XII-2); the second a Spaniard (Sevillan) who flourished a little earlier (XII-1). The book now edited by R. LEVY was written by IBN AL-UKKHUWA, who died in 1329 and was probably an Egyptian, witness, e.g., his enthusiastic account of the Nile water (p. 97). "The *Ma'ālim al-qurba* was written as a guide for the Muḥtasib—the official responsible in medieval and later Islam for the enforcement of the law—in the performance of his duties. It provides a summary of the positive and negative injunctions contained in the standard codes of the shar', together with regulations for the safeguarding of public morality, for assuring the purity of the faith and for protecting its adherents against trickery, charlatanry, fraud and extortion. The work contains copious extracts from earlier writers on the subject, but it possesses sufficient original material to provide, directly or indirectly, a lively picture of a Muslim town in the middle ages, with its workshops and markets, mosques and public baths, guilds and officials, and all the other crowded components of existence at such a time and place." The edition has apparently been prepared with

great care, and the editor has added a long analysis which is in some respects preferable to a translation. It is very easy to pass from the analysis to the relevant page of the Arabic text. There are good indices. I shall discuss this most interesting work more elaborately in vol. III of my *Introduction*.
G. S.

Patch, H. R. The last line of the *Commedia*. *Speculum* 14, 56-65, 1939. ISIS

Stapelmohr, Ivar von. LUDOLFS VON SUDHEIM Reise ins Heilige Land. Nach der Hamburger Handschrift hrsg. XI+158 p., 6 facs. (Lunder Germanistische Forschungen, 6). Lund, GLERUP, 1937. ISIS

Reviewed by PETER THOMSEN, *OLZ* 42, 164-66, 1939.

Ünver, A. Süheyl. Tanksuknamei ilhan der fünunu ulūmu hatai mukaddimesi. 72 p., facs. Istanbul, Millī Mecmua Basimevi, 1939 (in Turkish). ISIS

Dr. ÜNVER to whom we owe already so many important studies on oriental medicine is giving us here a Turkish translation of the Persian translation of a Chinese text made by order of RASHĪD AL-DĪN at Tabriz 1313-14. He discovered it in a Persian ms. of Hagia Sophia, no. 3596. The text translated is entitled in Arabic script Wānk shū khū which is obviously the transcription of WANG SHU-HO, name of a Chinese physician who flourished under the Western Chin dynasty (265-317) and wrote a famous treatise on the pulse, *Mo ching*, in ten books. It would be very interesting to compare the Chinese and Persian texts. I could not read the Turkish translation but examined the anatomical illustrations of the Hagia Sophia Persian ms.; they are typically Chinese (compare *Isis* 14, 255-63). For WANG SHU-HO (III-1) see my *Introduction* (1, 342, 1927; 2, 76, 1931) and *Isis* (15, 202, 1931). A special article devoted to this treatise has been prepared for *Isis* by Prof. ABDULHAK ADNAN.
G. S.

Wickersheimer, Ernest. La Peste Noire à Strasbourg et le " Régime " des cinq médecins strasbourgeois. *Proceedings of the third international congress of the history of medicine* (London, July 17th to 22nd, 1922), p. 54-60. Antwerp, 1923. ISIS

" Le manuscrit F. 4 de la bibliothèque du château de Berlebourg (Westphalie) présente aux feuillets 209-211 une copie datant de la fin du XV^e^ siècle d'un " Régime de pestilence " qui fut composé à Strasbourg, sans aucun doute à l'occasion de l'épidémie de 1349. En effet il a pour auteurs cinq médecins dont on relève les noms dans les archives strasbourgeoises à partir de 1336 et dont l'un, ALBERT DE PARME, est mort au plus tard en 1355. La seule épidémie grave qui ait eu lieu à Strasbourg de 1316 à 1358 est celle de 1349; c'est donc de 1349 qu'il faut dater le petit traité auquel ALBERT DE PARME a collaboré et que je publie ici pour la première

fois d'après le manuscrit unique de Berlebourg." " Ce petit traité n'offre, quant à la thérapeutique de la peste, rien dont on ne trouve l'équivalent dans d'autres " Régimes de pestilence " du moyen âge. Il a du moins le mérite d'être un des plus anciens opuscules du genre, comme il est aussi le plus ancien monument de la littérature médicale strasbourgeoise."

XIVth century (second half)

Bugiel, Dr. BOCCACE et la médecine. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 544-51, Évreux, 1922. ISIS

Ganzenmüller, Wilhelm. Ein italienisches Goldlüsterrezept vom Ende des 14. Jahrhunderts. *Angew. Chemie* 51, 254-56, 1938. ISIS

Horrell, Joe. CHAUCER's symbolic plowman. *Speculum* 14, 82-92, 1939. ISIS

Mercier, Louis. *'Aly ben 'Abder Raḥman ben Hodheil el Andalusy.* L'ornement des âmes et la devise des habitants d'el-Andalus : Traité de guerre sainte islamique. Reproduction du manuscrit de M. NEHLIL, revu et corrigé. 8+99 p. Paris, GEUTHNER, 1936. ISIS

Reviewed by D. S. MARGOLIOUTH, *Journal of the Royal Asiatic Society* 625-26, 1938.

Paoli, H. J. JUAN DE AVIÑÓN medico del secolo XIV. *Rivista di storia delle scienze* 30, 1-25, 1939. ISIS

Study on the Jewish-French physician MOSES BEN SAMUEL of Roquemaure (Gard), who was called after his conversion JOHN OF AVIGNON. The author does not seem to know anything about JOHN's early Jewish life. He deals mainly with the *Sevillana medicina*, quoting in full the Spanish preface of NICOLÁS MONARDES (Seville, 1545), extracts from JOHN's preface to the same work, its table of contents (69 chapters) and various extracts from the text (in Spanish). This study is interesting but a little too easy, most of it being simply in the form of quotations from other writings. G. S.

Singer, Charles. Sur un manuscrit attribué à GUY DE CHAULIAC. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 167-76, Évreux, 1922. ISIS

" Notre manuscrit contient deux parties dans la même écriture. La première commence avec les mots latins *In dei nomine incipit inventorium.* Après ces mots commence *La grande chirurgie* de GUY, en latin. Le texte est orné de huit miniatures et de beaucoup de figures d'instruments. J'ai reproduit ces miniatures et figures dans une autre publication. L'écriture

en est griffonnée et barbouillée. Dans la deuxième phrase on lit que l'œuvre de GUY a été composée dans l'année 1363 et que la transcription a été faite par ordre de JEAN TOURTIER, maître en chirurgie, ou par lui-même; la question si c'est écrit par lui ou par son ordre n'est pas bien claire. Le manuscrit dit, en outre, qu'il a été préparé par ce JEAN TOURTIER pour être présenté à JEAN, duc de BEDFORD, Régent de France. Ainsi on peut donner une date assez exacte au manuscrit, car JEAN, duc de BEDFORD, est devenu Régent en 1420 et est mort en 1435. Cette œuvre finit au milieu d'une colonne avec les mots : *Explicit liber peroptimus de cirurgiae ditus a* GUIDONE DE CHAULIACO *magistro in medicina et cirurgia.* Immédiatement dessous ces mots, dans la même colonne et de la même écriture, commence la petite œuvre d'astrologie que nous allons publier et qui est probablement l'œuvre perdue de GUY."

XVth **century** (whole and first half)

Gutkind, Kurt Sigmar. COSIMO DE' MEDICI. Pater patriae, 1389-1464. 333 p. Oxford, Clarendon Press, 1938. ISIS

Hulshof, M. H. Gebed en voorschriften tegen pest in een Utrechtsch getijdenboekje uit 1440. *Bijdragen tot de geschiedenis der geneeskunde* 19, 38-40, 1939. ISIS

Ogden, Margaret Sinclair. The '*Liber de diversis medicinis*' in the THORNTON manuscript (Ms. Lincoln Cathedral A.5.2). XXIX+160+8 p., frontispiece. London, Early English Text Society, 1938. ISIS

Probably written and compiled by ROBERT THORNTON, who became lord of East Newton, Yorkshire, in 1418. "The *Liber de diversis medicinis* is a compendium of remedies for various ailments. The remedies are arranged according to the part of the body affected, proceeding roughly from head to foot. They are for the most part in the form of recipes or prescriptions, varying in length from a single line to more than half a page. The simplest prescribe a specific medicine, especially part of an herb or an animal, for a given disease. The most complex list the ingredients and give directions for the preparation of elaborate medicaments, compound unguents, potions, and the like. Occasionally fairly long passages appear which are not in the regular form of a prescription or recipe. Among these are a list of the signs of death, a set of somewhat garbled directions for a simple surgical treatment in the case of headwounds, and a three-page discussion of the symptoms and treatment of the pestilence. Scattered through the English material there are a number of Latin recipes and charms, including three lines of verse and a long Latin passage giving directions for the mass of exorcism in the treatment of epilepsy" (p. xv). ... "One small fourteenth-century work is incorporated as a whole into the compilation. It is the smaller of the two treatises on the pestilence commonly attributed to JOHN OF BURGUNDY. THORNTON introduces it and concludes it without mention of the authorship. However, it is clear that he is translating the Latin treatise or giving a transcript of one of the many English translations.

A comparison of THORNTON's text with that of the one Latin manuscript which has been edited shows that it follows the Latin original closely. It is certainly not a transcript of either of the two manuscripts of English translations which have been edited."

XVth century (second half)

Alcalde, Don Alfonso Fernández de. Viage del Dr. MÜNZER por la España del siglo XV y observaciones suyas, relacionadas con los intereses de la medicina. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam), 18-23 juillet, 1927, p. 253-62, Anvers, 1929. ISIS

Beksan, Fuat Kâmil. Un document en langue turque intéressant l'histoire de la syphilis en Europe. *Türk tib tarihi arkivi* 3, 51-54, 1938. ISIS

Blake, John William. European beginnings in West Africa, 1454-1578 : a survey of the first century of white enterprise in West Africa, with special emphasis upon the rivalry of the great powers. VIII+212 p. (Imperial Studies). New York, LONGMANS, GREEN, 1937. ISIS

Bloch, Joshua. Early Hebrew printing in Spain and Portugal. 54 p. New York, Public Library, 1938. ISIS

Bortolotti, Ettore. Answer to Query 75 (*Isis* 29, 99). RAFAELE CANACCI. *Isis* 29, 409-10, 1938. ISIS

Diepgen, Paul. Geistliche und diätetische Ratschläge für Krampfsüchtige. Ein niederländischer Einblattdruck um 1500. *Beiträge zur Inkunabelkunde* 11, 4 p., 1 facs., 1938. ISIS

Guitard, E. H. Les plus anciens statuts de la corporation des apothicaires de Toulouse. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 426-30 Évreux, 1922. ISIS

Kristeller, Paul Oscar. MARSILII FICINI Florentini, Philosophi Platonici, opuscula inedita et dispersa. Primum collegit et ex fontibus plerumque manuscriptis edidit auspiciis regiae scholae normalis superioris Pisanae PAULUS OSCARIUS KRISTELLER. Accedunt indices codicum, editionum, operum FICINI nec non documenta quaedam

et testimonia ad eundem pertinentia. Preface by GIOVANNI GENTILE. 2 vols. CLXXXI+141 p.; 382 p. Florence, OLSCHKI, 1937. ISIS

Critical edition of 92 items written by MARSIGLIO FICINO or concerning him, hitherto unpublished or scattered in many publications which are not easily available. The editor has added an abundance of notes, a study of the MSS consulted in a great many European libraries, and an index of proper names. He has thus provided the student of the Italian Renaissance with a very valuable tool. Dr. KRISTELLER had been teaching in Pisa for three or four years; he is now in America. Let us hope that his great abilities will soon be recognized as they deserve to be and utilized for the benefit of others as well as himself. Germany and Italy's loss are, or should be, America's gain. G. S.

Madsen Victor. Katalog over det Kongelige Biblioteks Inkunabler. 2 vols., vol. 1, XXX+459 p., (in 3 parts) 1931-35; vol. 2, 575 p. (in 3 parts), 1936-38. København, LEVIN & MUNKSGAARD. ISIS

Elaborate scientific catalogue of one of the richest collections of incunabula, that of the Royal Library of Copenhagen, the nucleus of which dates back to the rule of FREDERICK III, King of Denmark from 1648 to 1670. 4265 items are listed, the characteristics of each copy being indicated and its provenance, together with the usual references to HC, Cop., BMC, etc. This is followed (in vol. 2, 293-433) by a geographical classification of the incunabula by countries, cities, and printers. Then comes an index of printers; a concordance of the Hain-Copinger numbers with the Copenhagen ones, old and new, rich indices and bibliography. A splendid addition to the incunabula catalogues, worthy of the collection which it analyzes. G. S.

Moreland, W. H. (†). The ships of the Arabian Sea about A.D. 1500. *Journal of the Royal Asiatic Society* 63-74, 1939 (to be cont'd). ISIS

Nemoy, Leon. The treatise on the Egyptian pyramids (*Tuḥfat al-kirām fī khabar al-ahrām*) by JALĀL AL-DĪN AL-SUYŪṬĪ. Edited, with introduction, translation and notes. *Isis* 30, 17-37, 1939. ISIS

For Arabic text order Document 1064 from American Documentation Institute, care of Science Service, 2101 Constitution Ave., Washington, D.C.; remitting 40 cents for microfilm form; $2.00 for photocopies readable without optical aid.

Polain, M.-L. Bibliographie de l'ancienne médecine: incunables et manuscrits. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 197-200, Évreux, 1922. ISIS

(**Regiomontanus**) Der deutsche Kalender des JOHANNES REGIOMONTAN,

Nürnberg, um 1474. Faksimiledruck nach dem Exemplar der Preussischen Staatsbibliothek. Mit einer Einleitung von ERNST ZINNER. 20+60 p., figs. (Veröffentlichungen der Gesellschaft für Typenkunde des XV. Jahrhunderts—Wiegendruckgesellschaft, Reihe B : Seltene Frühdrucke in Nachbildungen, 1). Leipzig, HARRASSOWITZ 1937. ISIS

Reviewed by A. POGO, *Isis* 30, 111-13, 2 fig., 1939.

Sarton, George. The beginning of European syphilis. Query no. 77. *Isis* 29, 406-07, 1938. ISIS

Sarton, George. The scientific literature transmitted through the Incunabula (An analysis and discussion illustrated with sixty facsimiles). *Osiris* V, 41-245, 1938. ISIS

Elaborate investigation based on KLEBS' *Incunabula scientifica* (*Osiris* 4, 1937). Contents : I. KLEBS' *Incunabula scientifica*. II. Definition of incunabula; III. Definition of scientific incunabula; IV. Incunabula versus manuscripts; V. The diffusion of knowledge; VI. The standardization of knowledge; VII. Retrogressive character of the scientific incunabula; VIII. Scientific novelties and contemporary authors; IX. Sizes of the incunabula and of their editions; X. National or cultural distribution of the authors of scientific incunabula; XI. Linguistic distribution; XII. Conclusions; Appendix I. The most popular authors of scientific incunabula; II. The best-sellers; III. Anonymous scientific incunabula; IV. Chronological list of the authors whose scientific works were printed before 1501. Illustrated with a collection of 60 facsimiles covering the whole field of scientific incunabula with explanatory notes and full index.

Scholderer, Victor. Der Buchdruck Italiens im fünfzehnten Jahrhundert. Übersetzt von KURT OHLY. *Beiträge zur Inkunabelkunde* II, 45 p., 1938. ISIS

Stearns, Marshall W. ROBERT HENRYSON and the Fulgentian horse. *Modern language notes* 54, 239-45, 1939. ISIS

Zinner, Ernst. Leben und Wirken des JOHANNES MÜLLER VON KÖNIGSBERG genannt REGIOMONTANUS. XIII+294 p., 92 figs. (Schriftenreihe zur bayerischen Landesgeschichte, 31). München, BECK, 1938. ISIS

Reviewed by A. POGO, *Isis* 30, 109-11, 1 fig., 1939.

Leonardo da Vinci

Berence, Fred. LÉONARD DE VINCI, ouvrier de l'intelligence. 376 p., 21 illus. Paris, PAYOT, 1938. ISIS

MacCurdy, Edward. The notebooks of LEONARDO DA VINCI. Arranged, rendered into English and introduced by EDWARD MACCURDY. 2 vols. 655, 640 p. New York, REYNAL & HITCHCOCK, 1938. ISIS

Richter, Jean Paul. The literary works of LEONARDO DA VINCI. Second edition enlarged and revised by JEAN PAUL RICHTER and IRMA A. RICHTER. 2 vols. XXX+393 p., 64 pl.; XII+458 p., 58 pl. Oxford University Press, 1939. ISIS

Vallentin, Antonina. LEONARDO DA VINCI; the tragic pursuit of perfection. Translated into English by E. W. DICKES, XII+561 p. New York, Viking, 1938. ISIS

Wright, W. LEONARDO DA VINCI's work on the structure of the heart. *Proceedings of the Third International Congress of the History of Medicine* (London, 1922), p. 94-95, Antwerp, 1923. ISIS

XVIth century (whole and first half)

A. — *Mathematics*

Sturge, Charles. CUTHBERT TUNSTAL, churchman, scholar, statesman, administrator. 413 p. London, LONGMANS, GREEN, 1938. ISIS

B. — *Physical sciences and technology*

Walde, O. Doktor JOHANN COPP. Ein Arzt und Astrologe aus der Reformationszeit. *Lychnos* 225-67, 1938 (in Swedish with German summary). ISIS

Wasiutyński, J. KOPERNIK. XVIII+666 p., 2 pl., 123 fig. Warsaw, PRZEWORSKI, 1938. ISIS

C. — *Natural sciences*

Aiton, Arthur S. CORONADO's muster roll. *American Historical Review* 44, 556-70, 1939. ISIS

Cortesão, Armando; Thomas, Henry. Carta das novas que vieram a el Rei nosso Senhor do descobrimento do PRESTE JOÃO (Lisboa, 1521). Texto original e estudio crítico com vários documentos inéditos. 175 p., maps, ills. Lisbon, 1938. ISIS

Reviewed by DANA B. DURAND, *Geogr. Review* 29, 346-47, 1939.

Denucé, J. L'Afrique au XVI^e siècle et le commerce anversois. 120 p., facs. (Collection de documents pour l'histoire du commerce, II). Anvers, DE SIKKEL, 1937. ISIS

Reviewed by E. HEAWOOD, *Geographical Journal* 92, 367-69, 1938. C. W. A.

Lopes, Francisco Fernandes. DUARTE PACHECO e o Oceano Pacifico. *Petrus Nonius* 2, 21-26, 1938. ISIS

Ricci, Seymour de. Onze Normands en terre sainte. *Mélanges syriens offerts à M.* RENÉ DUSSAUD 1, 87-90, 1939. ISIS

Sylvia, Esther. The destruction of old Guatemala. *More Books, Bulletin of the Boston Public Library*, 56-63, 1 facs., Feb. 1939. ISIS

Apropos of the earthquake which destroyed the capital of Guatemala in 1541. G. S.

D. — *Medical sciences*

Alcalde, Fernandez de. Un portrait de LUIS MERCADO, médecin des rois d'Espagne au XVI^e siècle. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 263-64, Antwerp, 1923. ISIS

Capparoni, Pierre. Les maîtres d'anatomie à l'Athénée romain de la Sapienza pendant le XVI^e siècle. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 93-101, Genève, 1926. ISIS

Crummer, Le Roy. The original drawing of the title page of the *Fabrica*. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 186-89, 1 pl., Anvers, 1929. ISIS

Delaunay, Paul. Les médecins manceaux en Suisse au XVI^e siècle. *V^e Congrès International d'Histoire de la médecine* (Genève, 1925), p. 53-59, Genève, 1926. ISIS

Diepgen, P. HIPPOKRATES oder PARACELSUS? 30 p. Stuttgart, Hippocrates-Verlag, 1937 (RM. 1.80). ISIS

In spite of all fundamental differences, HIPPOCRATES and PARACELSUS have features in common first of all in their life : both originate in a doctor's house, both gain medical experience by travelling. The difference between

their views of man and disease, i.e. between naive humoral pathology and a chemical dynamism which foreshadows modern medicine is, according to DIEPGEN, not so deep when the question is raised what this difference meant for the patient. Both used their experience in order to combat symptoms—there was hardly any aetiological therapy in which difference in medical theory could matter. PARACELSUS may be rightly called a follower of HIPPOCRATES in that he founded the description of new clinical entities on subtle observation and medical skill at the bedside. Both realise that there is and should be large room for empiricism in medicine. There is, however, the fundamental difference in the metaphysical and religious implications of PARACELSUS' work—unknown to the naive Greek physician. Both have helped, each in his way, to alleviate human suffering and should therefore form the ideal of the present-day physician. These are the main points of the booklet which contains an address to an audience of doctors. The points are presented in a lucid and most readable form. W. P.

Friedenwald, Harry. Immortality through Medical writ of error. DIONYSIUS : a Portuguese Jewish court physician ; with notes on BRUDUS LUSITANUS, his son, and on PIERRE BRISSOT. *Bulletin of the History of Medicine* 7, 249-56, Baltimore, 1939. ISIS

Johnsson, J. W. S. Une lettre de GIROLAMO FRACASTORO sur la poésie. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 66-72, 1 facs., Genève, 1926. ISIS

Lejeune, Fritz. Die wichtigsten spanischen Anatomen nach VESAL. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 178-85, Anvers, 1929. ISIS

Moon, R. O. PARACELSUS and medicine. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 102-08, Genève, 1926. ISIS

Oesterle, Friedrich. Die Anthropologie des PARACELSUS. 151 p. (Neue deutsche Forschungen, 151). Berlin, JUNKER & DUNNEHAUPT, 1937 (RM. 6.50). ISIS

This book—apparently a thesis—gives a short account of the cultural and philosophical background of the age of PARACELSUS, based on KARL JOEL's " Ursprung der Naturphilosophie aus dem Geiste der Mystik " and others, of PARACELSUS' personality as reflected in his work, and of some of his doctrines : e.g. those concerning the parallelism between macrocosm and microcosm, the stratification of the Eternal and " Nature " in man, man and his fate, the significance of heredity, the influence of the stars, the power of God, the freedom of will, coming into existence and passing away, the individual and the community, man and the church, of matrimony, education, soul and expression, the problem of nationalities. The author

interprets PARACELSUS' " Anthropologie " as a specifically German view of the world based on his experience as naturalist and physician, his belief in " blood and soil," and aiming at a national, political and racial revolution. The book therefore deals with PARACELSUS' possible significance in present day politics rather than with topics of the history of science or medicine.

W. P.

Ventura, Augusta Faria Gersão. Notas acêrca de alguns " simples e drogas " do *Auto dos Físicos* de GIL VICENTE. *Petrus Nonius* 2 9-20, 1938. ISIS

Villaret, Maurice ; Moutier, François. Contribution à l'étude du plagiat iconographique chez les anatomistes du XVI^e siècle. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 117-20, Antwerp, 1923. ISIS

E. — *Alia*

Schlichting, Th. H. THOMAS MORE over neigingen tot zelfmoord. *Bijdragen tot de geschiedenis der geneeskunde* 19, 68-72, 1939. ISIS

Discussion by MORE of tendencies to suicide. G. S.

Wang Tch'ang-tche. La philosophie morale de WANG YANG-MING. 217+31 p. (Variétés sinologiques, 63). Paris, GEUTHNER, 1936. ISIS

Reviewed by MIRCEA ELIADE, *Zalmoxis, Revue des études religieuses* 1, 243-45, 1938.

XVIth century (second half)

B. — *Physical sciences and technology*

Jelitai, József. Eines ungarischen Gelehrten Tiefenmesser aus dem Jahre 1563. *Különlenyomat a Tenger* XXVII. *évfolyam*, 1937, X-XII. szamabol., p. 2-3. ISIS

" Die erste, und zwar praktische Geometrie von einem ungarischen Verfasser ist ein stattliches deutsches Buch von 256 Seiten mit vielen schönen Abbildungen : ' Ein kurtze und grundliche anlaytung zu dem rechten Verstand Geometriae. Durch CHRISTOFFEN PUEHLER von Syclas in Ungern.' Gedruckt in Dillingen (Bayern), 1563. Datum des Vorwortes : ' S. Nicola bey Passaw, den 9. tag Februarij. Anno 1561.' "

C. — *Natural sciences*

Delaunay, Paul. Les voyages en Angleterre du médecin naturaliste PIERRE BELON du Mans. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 306-08, Antwerp, 1923. ISIS

Leclerc, Henri. A propos d'un passage de SHAKESPEARE relatif au chardon bénit. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 267-69, Antwerp, 1923. ISIS

D. — *Medical sciences*

Brodier, L. L'œuvre de GUILLAUME BAILLOU. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 559-64, Évreux, 1922. ISIS

Dooren, L. ADRIAEN VAN HOUTENBORCH, aangesteld als lijfarts van het Hof van Gelderland (1570). *Bijdragen tot de geschiedenis der geneeskunde* 19, 35-37, 1 pl., 1939. ISIS

Dujardin, B. Note historique sur l'acare de la gale. *Archives belges de dermatologie et de syphiligraphie*, 1, 3-9, 1938. ISIS

Dès 1551, le médecin belge THRIVERIUS a fait une allusion étiologique très claire à l'acare; ses idées sur la gale doivent lui valoir une place dans l'histoire de la découverte de la première maladie d'origine exogène.

Giordano, D. Un poitevin spécialiste pour la " caroncule uréthrale," à Venise, au XVI^e siècle : PIERRE SIVOS. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 469-72, Évreux, 1922. ISIS

Guisan, André. Autour du contrat de mariage de FABRICE DE HILDEN. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 29-34, Genève, 1926. ISIS

Jorge, Ricardo. La grippe, le typhus et l'encéphalite dans les épidémies historiques du XVI^e siècle. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 337-40, Évreux, 1922. ISIS

Kroon, J. E. Le premier professeur en médecine à l'université de Leyde. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 156-57, Anvers, 1929. ISIS

Apropos of GERARD DE BONT, 1536-1599. I B. C.

Laignel-Lavastine; Vinchon, Jean. Les démonopathies et l'incubat au XVI^e siècle; tableaux cliniques et traitement. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 148-52, Genève, 1926. ISIS

Laignel-Lavastine; Vinchon, Jean. Les observations psychiatriques de JEAN SCHENCK. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 169-74, Antwerp, 1923. ISIS

Ménétrier, P. Anecdotes et pratiques médicales du XVI^e siècle d'après les "Contes d'Eutrapel." *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 35-41, Évreux, 1922. ISIS

Tallmadge, G. Kasten. SCAEVOLA of Sainte-Marthe and the *Paedotrophia*. *Bulletin of the History of Medicine* 7, 279-314, 3 fig., Baltimore, 1939. ISIS

Van Schevensteen, A. F. C. Quelques ambulants à Anvers à la fin du XVI^e siècle. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 169-77, Anvers, 1929. ISIS

(Wier, Johannes, 1515-1588). In memoriam (1588-1938). By H. KRONHEIMER. *Bijdragen tot de geschiedenis der geneeskunde* 18, 324-25, 1 pl. 1938. ISIS

Zekert, Otto. Dispensatorium pro pharmacopoeis Viennensibus in Austria 1570. Herausgegeben vom Oesterreichischen Apothekerverein und der Gesellschaft für Geschichte der Pharmazie. 164 p. Berlin, HÖSEL, 1938. ISIS

E. — *Alia*

Tallmadge, G. Kasten. JUAN DE MARIANA. *Jesuit Thinkers of the Renaissance* p. 157-192 (no date, no place, received May 1939). ISIS

XVIIth century (whole and first half)

A. — *Mathematics*

Cassirer, Ernst. DESCARTES' Dialog " Recherche de la vérité par la lumière naturelle " und seine Stellung im ganzen der cartesischen Philosophie. Ein Interpretations-Versuch. *Lychnos* 139-79, 1938. ISIS

Dubreuil-Chambardel, Louis (d. 1927). Les origines tourangelles de DESCARTES. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam 18-23 juillet 1927) p. 247-52, Anvers, 1929. ISIS

Fosseyeux, Marcel. Les études anatomiques de DESCARTES en Hollande 1628-1649. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 121-24, Antwerp, 1923. ISIS

Karpinski, Louis C. DESCARTES and the modern world. *Science* 89, 150-52, 1939. ISIS

Saltykow, M. N. " La géométrie " de DESCARTES. 300^e anniversaire de Géométrie analytique. *Bulletin des sciences mathématiques* 62, 28 p., 1938. ISIS

Schrecker, P. Bibliographie de DESCARTES savant. *Thalès* 3 (1936), 145-54, Paris, ALCAN, 1938. ISIS

B. — *Physical sciences and technology*

Hinsdale, Guy. *Aerologia* : By DOMENICO PANAROLO—Rome, 1642. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 309-11, Antwerp, 1923. ISIS

Humbert, Pierre. La détermination des coordonnées géographiques au début du 17^e siècle. *Ciel et Terre* 54, 233-38, 1938. ISIS

Kepler, Johannes. Gesammelte Werke. Herausgegeben im Auftrag der Deutschen Forschungsgemeinschaft und der Bayerischen Akademie der Wissenschaften unter der Leitung von WALTHER VON

DYCK und MAX CASPAR. München, BECK. Bd. I, *Mysterium cosmographicum. De stella nova.* Hrsg. von MAX CASPAR. XV+493 p., 1938; Bd. II. *Ad Vitellionem Paralipomena. Astronomiae pars optica,* hrsg. von FRANZ HAMMER. 465 p., 1939; Bd. III, *Astronomia nova,* hrsg. von MAX CASPAR, 487 p., 1937. ISIS

McColley, Grant. The ROSS-WILKINS controversy. *Annals of Science* 3, 153-89, 1938. ISIS

Michel, Henri. Un astrolabe de LAMBERT DAMERY. *Ciel et Terre* 55, 86-93, 4 fig., 1939. ISIS

Astrolabe made in 1614. LAMBERT DAMERY may have been a mathematician at Brussels. He was the father of three Belgian painters of that time. D. N.

Mieli, Aldo. Il tricentenario dei " Discorsi e dimostrazioni matematiche " di GALILEO GALILEI. *Archeion* 21, 193-197, 1938 (rec'd Feb. 1939). ISIS

C. — *Natural sciences*

Haden, Russell L. The origin of the microscope. *Annals of Medical History* 1, 30-44, 15 fig., 1939. ISIS

Jeanselme, E. L'œuvre de J. BONTIUS. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amstersam, 18-23 juillet, 1927), p. 209-28, 3 figs., Anvers, 1929. ISIS

D. — *Medical sciences*

Bayon, H. P. WILLIAM HARVEY, physician and biologist : his precursors, opponents and successors. *Annals of Science* 3, 59-118, 2 pl. ; 435-56, 2 pl., 1938. ISIS

Belohlaveck, Dr. Dissertations de la Faculté de Médecine de Prague, au XVII^e siècle. *Comptes rendus de Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 156-66, Évreux, 1922. ISIS

Courtney, J. W. The versatility of Dutch pioneers in American medicine. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 191-94, Anvers, 1929. ISIS

Cumston, Charles Greene. Un chirurgien zurichois au XVIII^e siècle. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 86-87, Anvers, 1927. ISIS

Apropos of HANS JACOB AMMANN (1586-1658). The title is incorrect, read XVII for XVIII. G. S.

Cumston, Charles Greene. Note sur Maître MOYSE CANADELLE et son petit traité de la peste. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 257-60, Genève, 1926. ISIS

De Mets, A. Les testaments des pestiférés. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 68-73, Anvers, 1927. ISIS

Gibson, Thomas. Doctor THEODORE TURQUET DE MAYERNE's account of the illness, death and post-mortem examination of the body of his Royal Highness, Prince HENRY OF WALES. Translated from the French version in BROWNE's "Opera medica." *Annals of Medical History* 10, 550-60, 2 fig., 1938. ISIS

Krumbhaar, E. B. Seventeenth century medical literature as exemplified in the Elzevier presses. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 109-13, 13 fig., Genève, 1926. ISIS

Laignel-Lavastine. JACQUES DUVAL d'Évreux, et l'épitaphe de Dame MARGUERITE à Loudun près de la Haye. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23, juillet, 1927), p. 324-26, Anvers, 1929. ISIS

Plantier, L. FRANÇOIS CHOMEL, d'Annonay, et son manuscrit. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine*, Paris, 1921, p. 137-39, Évreux, 1922. ISIS

"L'énorme volume manuscrit que j'ai l'honneur de présenter au Congrès constitue, je crois, une rareté digne d'être signalée. Il renferme presque tous les documents de la vie médicale d'un très honorable confrère du XVII^e siècle exerçant notre art dans une petite ville du Vivarais, à Annonay, où, personnalité éminente, il fut appelé à trois reprises à remplir les fonctions de Consul avec la plus grande dignité et pour le plus grand profit de ses concitoyens. Je tire de ce manuscrit et des notes publiées par PONCER et NICOD les éléments de cette notice."

Power, Sir D'Arcy. Dr. WILLIAM HARVEY as a man and an art

connoisseur. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 452-56, Évreux, 1922. ISIS

Römer, L. S. A. M. von. "Een verzonnen beeltenis." Eenige opmerkingen naar aanleiding van het ingezonden artikel van D. SCHOUTE. *Bijdragen tot de geschiedenis der geneeskunde* 18, 304-06, 1 pl., 1938. ISIS

Apropos of a portrait of REINERUS BONTIUS. G. S.

Thorndike, Lynn. Answer to Query 61 (*Isis* 25, 452-54). JOHANNES SCULTETUS, in the sixteenth century. *Isis* 29, 408, 1938. ISIS

Torrey, Harry Beal. ATHANASIUS KIRCHER and the progress of medicine. *Osiris* V, 246-75, 1938. ISIS

The *Scrutinium* (Rome, 1658) "after a brief popularity achieved largely through the active promotion of KIRCHER's admirer, CHRISTIAN LANGE, rapidly lost its initial prestige. KIRCHER himself does not mention it in his autobiography... There can be no doubt that the very slow improvement of the microscope during the next hundred years delayed the development of microbiology in spite of LEEUWENHOEK's discovery of bacteria and the pioneer observations which he and HOOKE made upon various protista. KIRCHER, however, took no part in these discoveries. He contributed no well authenticated observation to microbiology or the history of infectious disease. He established no useful generalization. He made no stimulating suggestions for research. In his own times, he belonged to the past. And in so far as he failed to affect the future, this, rather than any lack of optic apparatus, would appear to have been the determining factor in the result."

Van Gils, J. B. F. BOERHAAVE op de planken. Il medico olandese, commedia in cinque atti in versi di CARLO GOLDONI. *Bijdragen tot de geschiedenis der geneeskunde* 18, 325-32, 1938. ISIS

Apropos of CARLO GOLDONI's play *Il medico olandese*. G. S.

E. — *Alia*

Andrade, E. N. da C. Science in the seventeenth century. *Nature* 142, 19-30, 5 fig., 1938. Also in *Proc. Roy. Inst.* 30, 36 p., 1938. ISIS

Dahl, Folke. New contributions to the history of the earliest Dutch and French newspapers. *Lychnos* 53-91, 6 fig., 1938 (in Swedish with English summary). ISIS

George, Albert Joseph. A seventeenth-century amateur of science : JEAN CHAPELAIN. *Annals of Science* 3, 217-36, 1938. ISIS

Livingston, Dorothy Flower; **Patton, Mollie Marjorie** and others. Contribution to a bibliography of FRANCIS BACON. Editions before 1700 in Yale libraries. *Papers in honor of* ANDREW KEOGH, p. 95-143, 1938. ISIS

Major, Ralph H. ATHANASIUS KIRCHER. *Annals of Medical History* 1, 105-20, 8 figs., 1939. ISIS

McColley, Grant. JOHN WILKINS—a precursor of LOCKE. *Philosophical Review* 47, 642-43, 1938. ISIS

Merton, Robert K. Science and the economy of seventeenth century England. *Science and Society* 3, 3-27, 1938. ISIS

Merton, Robert K. Science, technology and society in seventeenth century England. *Osiris* 4, 360-632, 1938. ISIS

Reviewed by WALTER PAGEL, *Cambridge Review* 60, 72, 1938.

Ross, Sir Edward Denison. The journal of ROBERT STODDART. Being an account of his experience as a member of Sir DODMORE COTTON's mission in Persia in 1628-29. Published from the unique manuscript preserved in the Bodleian library. With an introduction and notes. 128 p., map. London, LUZAC, 1935. ISIS

Silvette, Herbert. A short-title list of the writings of PHILEMON HOLLAND of Coventry, Doctor of Physicke. x+17 p. University of Virginia Press, 1939. ISIS

"This handlist of the writings of PHILEMON HOLLAND is being issued as a forerunner of a detailed bibliography. It is probably incomplete, and therefore tentative. The items have nevertheless been numbered as a means of convenient and ready reference. The short titles conform to those given in the *Short Title Catalogue*, but the imprints have been transcribed in full whenever possible. All additions and corrections will be gratefully received, and I shall also be glad to learn of the location of copies of the rarer items. If those who possess editions herein unrecorded will send me descriptions in accordance with the bibliographical conventions set forth at the end of the handlist, I shall make proper acknowledgment of their kindness."

Vandevelde, A. J. J. Natuurwetenschap en folklore. *Oostvlaamsche Zanten* 13, 33-46, 1938. ISIS

Apropos of J. B. VAN HELMONT and K. DIGBY.

XVIIth century (second half)

A. — *Mathematics*

Hofmann, Jos. E. Weiterbildung der logarithmischen Reihe MERCATORS in England. *Deutsche Mathematik* 3, 598-605, 2 fig. (no date, rec'd Jan. 1939). ISIS

Apropos of J. GREGORY's treatise : N. MERCATORIS *quadratura hyperboles geometrice demonstrata* (1688). G. S.

Pelseneer, Jean. La pomme de NEWTON. *Lychnos* 366-71, 1938 (in Swedish with French summary). ISIS

" L'auteur de cet article traite de l'anecdote bien connue de la pomme de NEWTON, qui semble s'être répandue, grâce surtout à VOLTAIRE : celui-ci la raconte en effet, et dans ses *Lettres Philosophiques* et dans les dernières éditions des *Éléments de la philosophie de* NEWTON. De nombreuses autorités ont refusé d'accorder tout crédit à cette anecdote, mais son authenticité ne peut plus être contestée depuis la publication, en 1936, des *Memoirs of Sir* ISAAC NEWTON*'s life* par WILLIAM STUKELEY. L'auteur termine son exposé par quelques réflexions sur les parts respectives de la logique et du hasard dans l'invention scientifique, thème essentiel que l'anecdote de la pomme de NEWTON, entre autres, est appelée à illustrer. D'autre part, les lecteurs étrangers de Lychnos sont renvoyés à l'article que l'auteur a consacré au même sujet, dans la revue belge *Ciel et terre*, 1937, pp. 190-193."

B. — *Physical sciences and technology*

Daujat, J. OTTO DE GUERICKE et les origines de la science de l'électricité. *Thalès* 3 (1936), 104-06, Paris, ALCAN, 1938. ISIS

Greenwood, M. The first life table. *Notes and records* no. 2, p. 70-72, Royal Society of London, 1938. ISIS

Apropos of HALLEY's table of 1693 for which see facsimile in *Isis* 23, p. 16, 1935. G. S.

Humbert, Pierre. La détermination des latitudes à la fin du 17^{e} siècle. *Ciel et Terre*, 55, 81-86, 1939. ISIS

Huygens, Christiaan (1629-95). *Œuvres complètes de* CHRISTIAAN HUYGENS, publiées par la Société hollandaise des sciences. Tome dix-neuvième, *Mécanique théorique et physique de* 1666 *à* 1695. HUYGENS *à l'Académie royale des sciences*. 688 p. La Haye, NIJHOFF, 1937. ISIS

Reviewed by GEORGE SARTON, *Isis* 29, 431-33, 1938.

MacPike, Eugene Fairfield. Dr. EDMOND HALLEY (1656-1742). A bibliographical guide to his life and work arranged chronologically preceded by a list of sources, including references to the history of the Halley family. 54 p. London, TAYLOR and FRANCIS, 1939. ISIS

MacPike, Eugene Fairfield. HEVELIUS, FLAMSTEED and HALLEY. Three contemporary astronomers and their mutual relations. x+140 p., ill. London, TAYLOR & FRANCIS, 1937. ISIS

Reviewed by JEAN PELSENEER, *Isis* 29, 433, 1938.

McCarthy, John S. Physics in American colleges before 1750. *American Physics Teacher* 7, 100-04, 5 fig., 1939. ISIS

McColley, Grant. The " New Systeme of the Mathematiks." *Annals of Science* 3, 238, 1938. ISIS

" Among the various indications that mark the gradual acceptance of heliocentric astronomy, few are more suggestive than its use in text-books prepared for students below college level. One of the earliest, if not the earliest, of the English text-books that presented the COPERNICAN hypothesis to ' young Learners ' was *A New Systeme of the Mathematicks*, London, 1681. The work was planned and to an important degree written by Sir JONAS MOORE."

Melmore, Sidney. ABRAHAM SHARP's universal instrument. *The Observatory* 61, 248-50, 1938. ISIS

Nierenstein, M. Query no. 79. A seventeenth century artificial representation of the four elements. *Isis* 30, 95, 1939. ISIS

Apropos of HIERONYMUS AMBROSIUS LANGENMANTEL (1641-1718). G. S.

Rooseboom, Maria. Bijdrage tot de kennis der optische eigenschappen van eenige microscopen van VAN LEEUWENHOEK. *Bijdragen tot de geschiedenis der geneeskunde* 19, 1-8, 1 pl., 1939. ISIS

Turnbull, H. W. JAMES GREGORY (1638-75). *The Observatory* 61, 268-74, 1938. ISIS

Whitrow, F. J. ROBERT HOOKE. *Philosophy of Science* 5, 493-502, 1938. ISIS

C. — *Natural sciences*

Cole, F. J. Microscopic science in Holland in the seventeenth century. *Journal of the Quekett microscopical club*, 1, 20 p., 5 pl., 1938. ISIS

" The three representatives of Dutch microscopy of the seventeenth century whose work we have been considering by no means exhaust the Hollanders of that prolific century, but they were unquestionably the outstanding figures. We see in LEEUWENHOEK a pure microscopist and a resolute and successful opponent of the dangerous fallacies of spontaneous generation. SWAMMERDAM not only explored the minute anatomy of animals with dissecting microscopes, but was the first to throw any light on the subtleties of insect metamorphosis. Already in 1667 he had satisfied himself on the latter point, and was claiming that the world had now no reason to lament the loss of HARVEY's treatise on Insects. RUYSCH taught us that the mere technique of science had its victories, and therefore should be studied for its own sake."

Heinemann, Käthe. Zur Geschichte der Entdeckung der roten Blutkörperchen. *Janus* 43, 1-42, 6 fig., 1939. ISIS

Hou-Jensen, H. NIELS STEENSEN—the great STENO. *Lychnos* 180-97, 3 fig., 1938 (in Swedish with English summary). ISIS

" 300 years ago, on New-Year's Day 1638, one of Denmark's greatest sons was born in Copenhagen—NIELS STEENSEN, anatomist, naturalist and bishop. Under his Latinized name, NICOLAUS STENONIUS, he became famous : his contemporaries called him ' the great STENO.' This name was given him primarily on account of his pioneering discoveries in anatomy concerning the structure and function of glands and muscles, of the heart and the brain. STENO made his greatest anatomical discoveries between his 21st and 25th years of age. Only 30 years old, he founded a new science, geology, concerning the earth and its development. These discoveries characterize STENO as the ingenious investigator and place him among the greatest scientists of the 17th century. STENO made all his discoveries in foreign countries (Amsterdam, Leyden, Paris, Florence), and yet—only few men have carried the name of Denmark so widely and so honestly. STENO joined the Catholic Church in 1667, when he was 29 years old. He was ordained a priest in 1675, and bishop 1677. He gave up research work when his faculties were at their height of capacity, so that he might devote himself entirely to the fight for the kingdom which is not of this world. STENO died in Schwerin 1686, at the age of 48 years—a pauper. His followers, only a few in number, looked up to him as a saint. The Duke of Toscana had his body carried to Florence and buried in San Lorenzo-Florence, the town STENO had learned to love and was longing for in his last years."

Tjomsland, Anne. NIELS STENSEN : his tercentenary. *Annals of Medical History* 10, 491-507, 4 fig., 1938. ISIS

Van Seters, W. H. La vie et les œuvres de VAN LEEUWENHOEK. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 88-90, Anvers, 1929. ISIS

D. — *Medical sciences*

Capparoni, Pietro. GUILLAUME RIVA D'ASTI et ses expériences sur la transfusion du sang. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 306-08, Anvers, 1929. ISIS

Dorveaux, Paul. L'apothicaire LE FEBVRE NICAISE, dit NICOLAS. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 207-12, 1922, Antwerp, 1923. ISIS

Hazen, A. T. JOHNSON's life of FREDERIC RUYSCH. *Bulletin of the History of Medicine* 7, 324-34, 1939. ISIS

Horner, Norman Gerald. JOHN WESTOVER of Wedmore. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 178-81, Antwerp, 1923. ISIS

Kilmer, Fred B. Dr. JOHANNES MATTHAEUS FABER. The first monographist of Belladonna and allied Solanums. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 91-103, 2 facs., 2 figs., Anvers, 1929. ISIS

Lindsay, Lilian. Worms in the teeth. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 280-85, Anvers, 1929. ISIS

Largely apropos of LEEUWENHOECK. G. S.

Peyer, A. de. Un médecin schaffhousois du XVII^e siècle. Notice biographique. *V^e Congrès International d'Histoire de la Médecine* (Genève juillet, 1925), p. 35-37, Genève, 1926. ISIS

Apropos of JEAN CONRAD PEYER (1653-1712). G. S.

Ternowsky, W. N. "FREDERICUS RUYSCH," aus dem anatomischen Institut der Universität in Kasan. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 334-38, 4 figs., Anvers, 1929. ISIS

Ternowsky, W. N. Zur Geschichte der Chirurgie und der medizinischen Bildung in Russland vor PETER DEM GROSSEN. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 339-42, Anvers, 1929. ISIS

E. — *Alia*

Brown, Harcourt. L'Académie de Physique de Caen (1666-1675) d'après les lettres d'ANDRÉ DE GRAINDORGE. *Mémoires de l'Académie des Sciences, Arts et Belles-Lettres de Caen*, 9, 94 p., 1938. ISIS

This is a valuable continuation to HARCOURT BROWN's studies on scientific academies in the seventeenth century (Baltimore, 1924; *Isis* 22, 542). It is largely based on a collection of letters addressed to Bishop HUET (about whom see my article on ANQUETIL-DUPERRON, *Osiris* 3, 196), kept in the Laurentian library, Florence. A large series of those letters (more than 160) were written by ANDRÉ DE GRAINDORGE, a physician and citizen of importance in Caen. Many extracts from those letters are quoted. BROWN's study is a valuable contribution, but the lack of an index is deplorable. G. S.

George, Albert J. The genesis of the Académie des Sciences. *Annals of Science* 3, 372-401, 1938. ISIS

Gren, Erik. Contribution au souvenir de la nouvelle Suède. *Lychnos* 393-9, 1 facs., 1938 (in Swedish with French summary). ISIS

" L'auteur publie une traduction suédoise de la lettre d'adieux écrite en latin, par laquelle JOHAN PAULINUS—plus tard anobli sous le nom d'OLIVEKRANTZ et connu pour avoir été l'un des hommes d'état et diplomates les plus célèbres du 17^e siècle en Suède—rendait hommage à son ami plus âgé, JOHAN CLASSON RISINGH, alors que celui-ci, dernier gouverneur de la colonie suédoise en Amérique, se préparait en 1653 à partir pour le Nouveau Monde. Le principal intérêt de cette lettre est de donner expression de bonne heure dans la littérature suédoise à cet exotisme américain dont l'histoire, à partir du 16^e siècle, a été si admirablement retracée, et surtout dans les ouvrages de CHINARD."

Lankhout, J. Algemeene grondbegrippen der hedendaagsche affect-psychologie bij SPINOZA. *Bijdragen tot de geschiedenis der geneeskunde* 19, 28-34, 1939. ISIS

(Luther, Martin). MARTIN LUTHER's little catechism translated into Algonquian Indian by JOHANNES CAMPANIUS. Facsimile of the printed edition, Stockholm, 1696. With some notes by ISAK COLLIJN and an English version by DANIEL NYSTROM and E. W. OLSON.

160+21 p.; translation, 52 p. New York, Swedish American Tercentenary Association, 1938. ISIS

Reviewed by JOHN H. WUORINEN, *American Historical Review* 44, 647-49, 1939.

Miller, Perry; Johnson, Thomas H. The Puritans. XI+846 p. 10 pl. New York, American Book Co., 1938. ISIS

There is a double value to this volume. First, it is a token of the growing recognition of the importance of the history of sicence (for one of the nine chapters is devoted to science in Puritan America) and second, the presentation of Puritan science fills a timely need.

Following a general introduction of 64 p. on the "Puritan Way of Life" and "Puritans as Literary Artists," there are nine chapters as follows: "History; Theory of the State and Society; This World and the Next; Manners, Customs, and Behavior; Biographies and Letters; Poetry; Literary Theory; Education; Science." There are 20 p. of notes, 50 p. of bibliographies, and an index.

Each section is an account of the field as a whole; followed by writings of the most outstanding Puritan representatives in that field with a short biography of each. That Puritanism was not, in itself, completely inimical to science may be seen from the "enthusiastic (?) support" of the "new science" and from the fame of such Puritans as MATHER, WINTHROP, BRATTLE, and DUDLEY. The chief blot on the escutcheon is the short-lived witchcraft frenzy but this is more than compensated for by the role played by the Puritans in preventive medicine. The first clinical treatise ever written on inoculation —communicated to the Royal Society and published in the *Philosophical Transactions* (vol. XXXII, 1721, p. 33-35) — was the result of the work of ZABDIEL BOYLSTON (inspired by COTTON MATHER). BOYLSTON, during the smallpox epidemic of April 1721, inoculated 241 persons of whom only 6 died with the result that a bill introduced in the legislature aiming to forbid inoculation by law failed to pass. Following are the scientific articles in the volume other than those listed under "Education," etc.:

SAMUEL DANFORTH (1626-1674): *An astronomical description* (1665)

JOHN WINTHROP, jr. (1605/6-1676): *Letter concerning some natural curiosities* (1670)

LEONARD HOAR (c. 1630-1675): Letter to ROBERT BOYLE (1672)

NOADIAH RUSSELL (1659-1713) and WILLIAM WILLIAMS (1665-1741): *Concerning lightning and thunder* (1684) and *Concerning the nature of comets* (1685)

PAUL DUDLEY (1675-1750/51): *Method for making maple sugar* (1720) and *Method for discovering where bees hive* (1720)

COTTON MATHER (1663-1728): *Of the vegetables, Of man* (1721)

THOMAS BRATTLE (1658-1713): *The witchcraft delusion* (1692)

ZABDIEL BOYLSTON (1680-1766): *The way of proceeding in small pox* (1721)

The dates at the end of the titles of articles refer to publication, not necessarily to composition. I B. C.

Rudbeck, Olaus. *Atlantica.* Första delen. 590 p., frontispiece,

dedication by author to O. VERELIUS and postscript by editor, AXEL NELSON. Uppsala, ALMQVIST & WIKSELL, 1937. ISIS

Reviewed by O. LARSELL, *Isis* 30, 114-19, figs., 1939.

Rudbeck, Olaus. Taflor till OLAUS RUDBECK's *Atlantica*. (Plates of OLOF RUDBECK's *Atlantica*). Facsimile edition, published by the History of Science Society (Uppsala). Edited by AXEL NELSON. Uppsala, ALMQVIST & WIKSELL, 1938 (kr. 19.50). ISIS

This volume, of folio size, consists of a frontispiece, forty-three plates (160 figures), two chronological tables and description of figures to accompany RUDBECK's *Atlantica*, volume 1 (1937) which was reviewed in *Isis* (30, 114-19). O. L.

Sachse, William L. *The diary of* ROGER LOWE *of Ashton-in-Makerfield, Lancashire*, 1663-74. Foreword by WALLACE NOTESTEIN. xi+139 p. New Haven, Yale University Press, 1938 ($2.50). ISIS

"In this rare human document, a seventeenth-century journal kept by a humble apprentice to a mercer, is found a graphic account, often naïvely expressed, of country life in southern Lancashire at that time. ROGER LOWE tells of his work and of his pastimes, of the daily life of the village and of the countryside, of courting Lancashire lassies, and of infrequent trips as far afield as Liverpool, Manchester, and Chester. His position as clerk in the 'general store' and his ability to read and write made him a figure of some importance in this own, Ashton, and gave him an excellent opportunity to know what was going on. His diary not only gives us seventeenth-century rural life from a new angle, but also gives a vivid picture of nonconformity driven underground, for LOWE was a good Presbyterian at a time when nonconformity was being virtually outlawed. To any student of human nature this diary will prove both interesting and amusing; to the social historian it will be of immense value."

Schrecker, Paul. Une bibliographie de LEIBNIZ. *Revue Philosophique* 63, 324-46, Paris, 1938. ISIS

Review of ÉMILE RAVIER : *Bibliographie des œuvres de* LEIBNIZ (703 p., Paris, ALCAN, 1937), including important addenda and emendanda. G. S.

Schwartz, Benjamin. A Hebrew contribution to the development of lip-reading. *Jewish quarterly review* 29, 389-95, 1939. ISIS

Apropos of FRANCIS MERCURY VAN HELMONT : "Alphabeti verè naturalis Hebraici brevissima delineatio. Quae simul methodum suppeditat, juxta quam qui surdi nati sunt sic informari possunt, ut non alios saltem loquentes intelligant, sed atque ipsi ad sermonis usum perveniant," a treatise published in 1667 (not 1657 as printed on title page). By the way, the first conscious teacher of the deaf was the Benedictine PEDRO PONCE DE LEON (1520-84) and the first to write on their education, JUAN PABLO BONET in 1620. G. S.

XVIIIth century (whole and first half)

B. — *Physical sciences and technology*

Duhem, Jules. La machine volante de GUSMAO d'après une figure unique de 1709. *Thalès* 3 (1936), 55-67, Paris, ALCAN, 1938. ISIS

Ebstein, Erich. Die Verdienste der holländischen Schule um die Entwicklung der klinischen Thermometrie. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 190, Anvers, 1929. ISIS

Fuller, Henry M. The philosophical apparatus of Yale College. *Papers in honor of* ANDREW KEOGH, p. 163-80, 1938. ISIS

Hult, O. T. L'organisation sanitaire et le soin des malades pendant la campagne Russo-polonaise de CHARLES XII. *Lychnos* 95-135, 6 fig., 1938 (in Swedish with French summary). ISIS

Kilgour, Frederick G. Professor JOHN WINTHROP's notes on sun spot observations (1739). *Isis* 29, 355-61, 1 fig., 1938. ISIS

D. — *Medical sciences*

Boerhaave, Hermann (1678-1738). Bicentenary celebration, Leiden, 1938. *Isis* 29, 414, 1939. ISIS

Castiglioni, A. BOERHAAVE en Italie. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 75-76, Anvers, 1929. ISIS

Comrie, John D. An eighteenth century neurologist. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 25-28, Genève, 1926. ISIS

Apropos of ROBERT WHYTT (1714-66).

De Lint, J. G. Discours commémoratif de BOERHAAVE (19 juillet). *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 79-81, Anvers, 1929. ISIS

Fialon, Charles-Henri. Quelques prospectus charlatanesques du XVIII^e siècle. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 462-66, Évreux, 1922. ISIS

Gruen, Errico. GIOVANNI BATTISTA MORGAGNI, il grande patologo del ramo laringo-otologico. *Rivista di storia delle scienze* 29, 266-74, 1938. ISIS

Guisan, André. A quand remonte la première docimasie pulmonaire dans le canton de Vaud? *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 204-08, Anvers, 1929. ISIS

Laignel-Lavastine; Vinchon, Jean. Les aphorismes d'HERMAN BOERHAAVE et leur traducteur LA METRIE. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 327-29, Anvers, 1929. ISIS

Laignel-Lavastine; Vinchon, Jean. Un chapitre du "Médecin de MACHIAVEL" à propos de BOERHAAVE. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 77-78, Anvers, 1929. ISIS

Laignel-Lavastine. Notes sur JACQUES DAVIEL. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 219-21, Genève, 1926. ISIS

Laignel-Lavastine; Vinchon, Jean. Essai sur la médecine de l'esprit en France au XVIII^e siècle. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 184-93, Évreux, 1922. ISIS

Mauclaire, Placide. Les portraits de NICOLAS ANDRY, le père et le parrain de l'orthopédie infantile. *Bulletin de la Société française d'histoire de la médecine* 32, 209-14, 2 pl., 1938. ISIS

Mauclaire, Placide. Notice biographique sur EDME-CLAUDE BOURRU, dernier doyen de l'ancienne Faculté de Médecine de Paris. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 140-53, 1 fig., Évreux, 1922. ISIS

Menetrier, P. Les ancêtres du tréponème ou les vers vénériens de DEIDIER. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 262-65, Genève, 1926. ISIS

Moulé, Léon. Du rôle des médecins dans la lutte contre les épizooties au XVIII^e siècle. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 237-74, Évreux, 1922. ISIS

Power, Sir D'Arcy. ALBERT VON HALLER and the *Disputationes chirurgicae selectae*. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 9-17, 3 fig., Genève, 1926. ISIS

Sigerist, Henry E. A. BOERHAAVE pilgrimage in Holland. *Bulletin of the History of Medicine* 7, 257-75, 14 fig., 1939. ISIS

Van Schevensteen. Une famille d'oculistes ambulants. Les SCHAUWERMANS. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 54-67, Anvers, 1927. ISIS

E. — *Alia*

Bryant, Louise May; Patterson, Mary. The list of books sent by JEREMIAH DUMMER. *Papers in honor of* ANDREW KEOGH, p. 423-92, 1938. ISIS

This includes the second edition of NEWTON's *Principia*, 1713, which thus reached Yale very soon after publication G. S.

Holmbäck, Åke. Die Vorrede zum Gesetze des Jahres 1734 und die Sanktionierung desselben. *Lychnos* 333-64, 1938 (in Swedish with German summary). ISIS

Kilgour, Frederick G. The first century of scientific books in the Harvard College Library. *Harvard Library Notes* no. 29, 217-25, 1939. ISIS

Laignel-Lavastine. Le rôle des médecins dans les origines intellectuelles de la Révolution française. *Thalès* 3, (1936), 15-30, Paris, ALCAN, 1938. ISIS

XVIIIth century (second half)

A. — *Mathematics*

Agostini, Amedeo. Matematici livornesi: PIETRO PAOLI (1759-1839). *Liburni civitas* 11, 3-7, 2 fig., 1938. ISIS

Jelitai, József. Briefe von DANIEL BERNOULLI und CLAIRAUT an Graf JOSEF TELEKI. *Mathematischer und Naturwissenschaftlicher Anzeiger der Ungarischen Akademie der Wissenschaften* 57, 501-07, 1938 (in Hungarian with German summary). ISIS

Jelitai, József. CLAIRAUT, LA CONDAMINE, D'ALEMBERT und ihre Zeitgenossen nach den ungarischen Tagebüchern der Grafen JOSEF und SAMUEL TELEKI. *Matematikai és Fizikai Lapok* 44, 173-99, 1937 (in Hungarian). ISIS

Jelitai, József. DANIEL und JOHAN II BERNOULLI nach den ungarischen Tagebüchern und Briefen der Grafen JOSEF und SAMUEL TELEKI. *Matematikai és Fizikai Lapok* 43, 142-60, 1936 (in Hungarian, with German summary). ISIS

Volta, Luigi. GIUSEPPE RUGGERO BOSCOVICH. *Atti della XXVI Riunione della Società italiana per il progresso delle scienze*, Venezia 12-18 Sett., 1937, 4 pl. ISIS

B. — *Physical sciences and technology*

Artz, Frederick B. L'éducation technique en France au dix-huitième siècle (1700-1789). *Revue d'Histoire Moderne* 5-51, Sept.-Déc. 1938. ISIS

Boutaric, A. Un savant de la Convention : GUYTON-MORVEAU (1737-1816). *La rev. hebdomadaire* 47, 108-13, 1938. ISIS

Dyson, Sir Frank. Sir WILLIAM HERSCHEL, 1738-1822. *Nature* 142, 859-62, 1938. ISIS

Gray, Austin K. BENJAMIN FRANKLIN's library. IX+80 p. New York, MACMILLAN, 1937. ISIS

This charmingly written book tells the story of the first public library in America—the Library Company of Philadelphia founded by BENJAMIN FRANKLIN. A supplementary section deals with the famous Loganian Library which was incorporated with the Library Company in 1792. M. GRAY has written a very lively and learned book and at the same time a delightful one. M. F. A.-M.

Heyman, Harald J. FREDRIK MALLET et JOHAN HENRIK LIDÉN. Correspondance des années 1769-1770. *Lychnos* 270-308, 1938 (in Swedish with French summary). ISIS

" L'astronome et mathématicien FREDRIK MALLET (né en 1728, mort en 1797) était à l'époque de cette correspondance observateur astronome à l'Université d'Upsal, où il devint ensuite professeur de mathématiques. Ces lettres, publiées ici pour la première fois, sont toutes, à deux exceptions près, écrites par lui et adressées à son jeune ami JOHAN HENRIK LIDÉN (né

en 1741, mort en 1793), qui se fit plus tard un nom comme historien de la littérature et bibliographe.

Pendant la plus grande partie du temps sur lequel s'échelonne cette correspondance, MALLET se trouvait en expédition astronomique. Celle-ci avait pour principal but de lui permettre d'observer à Pello, petit village du nord de la Suède, connu dans l'histoire des sciences par la mesure de degrés effectuée en 1736-1737 par MAUPERTUIS et CELSIUS, le passage de Vénus sur le disque solaire dans la nuit du 3 au 4 juin 1769, événement qui était suivi avec le plus grand intérêt par les astronomes de différents pays d'Europe.

" LIDÉN se trouvait à ce moment en voyage d'études à l'étranger, voyage qu'il avait commencé en mai 1768 et au cours duquel il visita en deux ans le Danemark, l'Allemagne, la Hollande, l'Angleterre et la France. Il l'a raconté avec une remarquable abondance de détails dans un journal encore inédit en quatre volumes conservé à la bibliothèque de l'Université d'Upsal."

Kleiner, Israel S. HAHNEMANN as a chemist. *Scientific Monthly* 46, 450-54, 1938. ISIS

Lavoisier, Antoine Laurent. Traité élémentaire de chimie. Avant-propos par M. HENRY LE CHATELIER. XXXVIII+191 p. (Classiques de la découverte scientifique). Paris, GAUTHIER-VILLARS, 1937. ISIS

Reviewed by TENNEY L. DAVIS. *Isis* 29, 434, 1938.

Lippmann, Edmund O. von. ACHARD als Physiker. *Ztschr. Wirtschaftsgruppe Zuckerind.*, 89, *Techn. T.* 33-43, 1939. ISIS

Partington, J. R.; McKie, Douglas. Historical studies on the phlogiston theory. II. The negative weight of phlogiston. III. Light and heat in combustion. *Annals of Science* 3, 1-58, 1 pl.; 338-71, 1 pl., 1938. ISIS

Poynton, F. John. Doctors and the dawn of Aerostation. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 101-05, Antwerp, 1923. ISIS

C. — *Natural sciences*

Camper, Peter (1722-89). PETRI CAMPERI itinera in Angliam 1748-85. *Opuscula Selecta Neerlandicorum de Arte Medica*, fasciculus quintus-decimus, LIX+264 p., 17 pl. Amsterdam, 1939. ISIS

CAMPER's journals here published for the first time in English as well as in Dutch (or Latin), by Dr. B. W. TH. NUYENS, relate his " daily experiences on three journeys he undertook for medical purposes. When in 1748 as a young doctor, in 1752 as a youthful professor at Franeker's university, he went to England, he did this to improve his skill in the medical science,

preferable in midwifery. When, thirty-seven years later, in 1785 he revisited England, he went as a scientific man of mature experience, to communicate to his English colleagues his self-assured ideas on obstetrics, the fruits of regular investigations and a long practice. What CAMPER saw and heard on his scientific travels about medicine, surgery and midwifery he noted daily. He did more, however. He was a gifted, educated and artistic man, full of interest in physical sciences and natural history, which was practised with enthusiasm by scholars as well as by laymen in the eighteenth century. CAMPER, a shrewd observer, never omitted to enter a scientific or technical novelty in his diary. Thus these travel journals became historical documents to medical and physical science, written by the most famous Dutch doctor of the second half of the eighteenth century."

Gunther, R. T. Dr. WILLIAM THOMSON, F.R.S., a forgotten English mineralogist, 1761-c. 1806. *Nature* 143, 667-68, 1939. ISIS

Lacroix, Alfred. MICHEL ADANSON au Sénégal (1749-1753). *Bulletin du Comité d'Études historiques et scientifiques de l'Afrique Occidentale Française* 21, 5-92, port., 1938. ISIS

" MICHEL ADANSON fut un naturaliste remarquable, le premier et le plus célèbre des explorateurs scientifiques du Sénégal. Il est connu par la singularité de sa vie autant que par son œuvre. J'ai eu la bonne fortune de trouver dans la correspondance d'ANTOINE et de BERNARD DE JUSSIEU, récemment donnée à l'Académie des Sciences par un de leurs descendants, M. B. RAMOND GONTAUT, dix lettres de ce voyageur. Il m'a paru utile de publier ces documents inédits, intéressants à la fois pour l'histoire de la science et pour celle de notre colonie... Je fais précéder ces lettres de quelques pages complétées que j'ai consacrées à ADANSON dans une notice sur les Cinq DE JUSSIEU, lue à l'Académie des Sciences en 1936. Le texte de l'auteur a été respecté scrupuleusement. On remarquera que celui-ci n'employait pas encore la déformation de l'orthographe de la langue française qu'il a préconisée plus tard et qui rend si pénible la lecture de tant de ses œuvres."

Simpson, Lesley Byrd. California in 1792. The expedition of JOSÉ LONGINOS MARTINEZ. Translated by LESLEY B. SIMPSON. XIV+111 p., 1 map. San Marino, Huntington Library, 1938 ($2.75). ISIS

The manuscript account of this expedition, now in the Huntington Library, presents many problems by reason of its obscrurities, omissions [by copyists ?], and irreconcilable geographical contradictions. These discrepancies are so great as to lead to the suspicion of faking or padding in the accounts of the itineraries of this explorer, and his bombastic claims add to the suspicion. However, there remains a not inconsiderable amount of very valuable comment of an observant naturalist on the customs, modes of life, languages, and foods of the native Indians, and lists of plants and their uses by the Indians as medicines, of animals, products suitable for commerce, mineral

springs, and mineral resources. The importance of this expedition in the early botanical exploration in the Southwest is recognized by STANDLEY (1920) in his *Trees and Shrubs of Mexico*. This account of the expedition includes lists of collections forwarded to Madrid and to the Museum of Natural History which LONGINOS founded at his own expense in Mexico City. He had been commissioned by CHARLES IV to conduct a botanical survey of the Spanish Empire in the Americas. The *Gazeta* has references to his operations which ranged from Guatemala and Yucatan into the Californias. It is unfortunate that the manuscript is apparently incomplete and that no trace of his collections can be found today. Of medical interest is his record of the decimating ravages of syphilis among the natives. The translation is a finely finished one and the translator has added critical notes in elucidation of obscure references to scientific matters. C. A. K.

D. — *Medical sciences*

Beltrán, Juan Ramón. La organización sanitaria de Buenos Aires durante el virreinato del Rio de la Plata (1776-1810). *La Prensa Médica Argentina*, 25, 54 p., November 16, 1938. ISIS

Discusses the sanitary efforts of the early governors, the epidemics with particular reference to pest, hospitals, and the early conditions of the professions of medicine and pharmacy. In general the sanitary arrangements in Buenos Aires at the beginning of the 19th century conform to similar regulations elsewhere in the world.

Bernardis, Giovanni de. EUSEBIO VALLI (1755-1816). *Rivista di storia delle scienze* 29, 249-57, 1938. ISIS

Chinard, Gilbert. The life of a Parisian medical student in the eighteenth century. *Bulletin of the History of Medicine* 7, 374-80, Baltimore, 1939. ISIS

Apropos of P. J. B. C. DESFORGES (1746-1806). G. S.

Cook, S. F. Smallpox in Spanish and Mexican California, 1770-1845. *Bulletin of the History of Medicine* 7, 153-91, 1939. ISIS

Courbon, Paul. PINEL aux champs. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet 1927), p. 289-92, Anvers, 1929. ISIS

Courtney, J. W. BENJAMIN WATERHOUSE, M.D., American pioneer. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 73-80, 1 pl., Genève, 1926. ISIS

Fosseyeux, Marcel. Les établissements hospitaliers de Hollande vus

par un français à la fin du 18e siècle. *VIe Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 195-99, Anvers, 1929. ISIS

Herissay, Jacques. Ls médecins condamnés par le tribunal révolutionnaire de Paris (1793-1794). *VIe Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 276-79, Anvers, 1929. ISIS

Irissou, M.; Harrant, M. JEAN-FRANÇOIS IMBERT, médecin-chef de l'expédition de Minorque en 1756. *Bulletin de la Société française d'Histoire de la Médecine* 33, 18-20, 1939. ISIS

Keil, Harry. A note on EDWARD JENNER's lost manuscript on "Rheumatism of the heart." *Bulletin of the History of Medicine* 7, 409-11, 1939. ISIS

Lint, J. G. de. Une lettre de TRONCHIN et la méthode Suttonnienne de l'inoculation. *Ve Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 38-42, Genève, 1926. ISIS

McDaniel, W. B. (2nd). A letter from Dr. WILLIAMS SMIBERT, of Boston, to his former fellow-student at Edinburgh, Dr. JOHN MORGAN, of Philadelphia, written February 14, 1769. *Annals of Medical History* 1, 194-96, 1939. ISIS

Pergameni, Charles. Le guérisseur GIBBENS. *Le Folklore brabançon* 18, 36-41, 1938. ISIS

Middleton, William S. SAMUEL POWEL GRIFFITTS. *Annals of Medical History* 10, 474-90, 5 fig., 1938. ISIS

Rolleston, J. D. VOLTAIRE and English doctors. *Ve Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 18-24, Genève, 1926. ISIS

Rousset, J. Un trait du caractère de M.-A. PETIT (1718-94), d'après un livre de sa bibliothèque. *Bulletin de la Société française d'Histoire de la Médecine* 33, 33-36, 1939. ISIS

Szumowski, W. Une page d'histoire médicale du temps du gouvernement autrichien à Lwów (Lemberg) à la fin du XVIIIe siècle.

VI^e Congrès International d'Histoire de la Médecine (Leyde-Amsterdam, 18-23 juillet, 1927), p. 330-33, Anvers, 1929. ISIS

Trzebinski, S. Une lettre inédite de JENNER. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 343-45, Anvers, 1929. ISIS

Variot, G. Quelques souvenirs historiques sur l'anatomiste PIERRE CAMPER. Son œuvre en hygiène infantile. *VIe Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 362-65, Anvers, 1929. ISIS

Wiki, B. Note sur le Dr. CARL NICLAUS LANG, historiographe des épidémies d'ergotisme observées à Lucerne en 1709 et 1717. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 47-52, Genève, 1927. ISIS

Wrzosek, Adam. JEAN EMMANUEL GILIBERT (1741-1814). Organisation de l'École royale de Médecine à Grodno (1775-1781) sous le règne de STANISLAS AUGUSTE. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 161-162, Genève, 1926. ISIS

E. — *Alia*

Dehérain, Henri. Les savants à l'Exposition " BONAPARTE en Égypte". *Journal des Savants* 177-81, 1938. ISIS

Herbe, P. M. Les relations scientifiques russe-suédoises pendant la deuxième moitié du XVIII^e siècle. *Lychnos* 388-92, 1938 (In Swedish with French summary). ISIS

Holmberg, Arne. BENGT BERGIUS und seine Abschriftensammlung. (Randbemerkungen zu einem Register). *Lychnos* 199-222, 1938. (In Swedish with German summary). ISIS

Kemp, Jonathan (ed.). DIDEROT, interpreter of nature. 358 p. London, LAWRENCE & WISHART, 1937. ISIS

Reviewed by M. F. ASHLEY-MONTAGU, *Isis* 29, 435, 1938.

Thomas, John. JOSIAH WEDGWOOD and his portraits of 18th century men of science. *Nature* 143, 395-400, figs., 1939. ISIS

XIXth century (whole and first half)

A. — *Mathematics*

Ducassé, Pierre. AUGUSTE COMTE et le calcul des variations. *Thalès* 3 (1936), 39-43, Paris, ALCAN, 1938. ISIS

Gauss, Carl Friedrich. Inaugural lecture on astronomy and papers on the foundations of mathematics. Translated and edited by G. W. DUNNINGTON. 11+91 p. Baton Rouge, Louisiana State University Press, 1937. ISIS

Reviewed by D. J. STRUIK, *American Mathematical Monthly* 46, 98, 1939.

Jelitai, József. Zum Bildnis des FARKAS VON BOLYAI. *Matematikai és Fizikai Lapok* 45, 200-03, 1938 (in Hungarian, with German summary). ISIS

"Das hier wiedergegebene Bildnis ist das am meisten getreue und künstlerisch wertvolle Bildnis des FARKAS (WOLFGANG) VON BOLYAI. Das Original (schwarz-weisse Kreidezeichnung auf lichtbraunem Papier, Grösse 25 × 30 cm.), vom ungarischen Meister JANOS SZABÔ für die freiherrliche Familie VON KEMÉNY ausgeführt, befindet sich in der Bibliothek des protestantischen Kollegiums in Marosvásárhely (Siebenbürgen). Ein Bildnis des JÁNOS (JOHANN) VON BOLYAI ist nicht vorhanden. Über sein Äusseres enthält sein vorgefundener Reisepass (1849) folgende Angaben : mittlere Statur, Gesicht : länglich, Haare : gräulich, Augen : blau, Mund, Nase : proportioniert."

B. — *Physical sciences and technology*

(Becquerel). Célébration du centenaire de la chaire de physique du Muséum national d'histoire naturelle. *Revue générale des sciences* 50, 120-32, 1939. ISIS

The history of that chair is the history of the BECQUEREL family. G. S.

Cornell, E. S. The radiant heat spectrum from HERSCHEL to MELLONI. The work of HERSCHEL and his contemporaries. *Annals of Science* 3, 119-37, 402-16, 1938. ISIS

Dumas, J. B. Leçons de philosophie chimique. Avant-propos par M. GEORGES URBAIN. XXVIII+270 p. (Classiques de la découverte scientifique). Paris, GAUTHIER-VILLARS, 1937. ISIS

Reviewed by TENNEY L. DAVIS, *Isis* 29, 436, 1938.

Jelitai, József. Briefe von GAUSS und ENCKE im ungarischen Landesarchiv. Beitrag zur Geschichte der Astronomie in Ungarn. *Mathematischer und Naturwissenschaftlicher Anzeiger der Ungarischen Akademie der Wissenschaften* 57, 136-43, 1938 (in Hungarian with German summary). ISIS

" PASQUICH wollte, als Direktor der neuen Sternwarte am Gerhardsberg einen Schüler von GAUSS zum Adjunkten haben. Ich fand im Budapester Landesarchiv einen Brief von GAUSS und Teile von zwei früheren Briefen von ihm, wo er ENCKE und GERLING für diese Stelle empfiehlt. ENCKE bat PASQUICH um eine Frist. Vorstehend die buchstäblich genaue Widergabe dieser Briefe."

Kleim, Jean A. Les grandes inventions modernes et l'opinion des contemporains à leur apparition. La photographie. *Ciel et Terre* LIV, 385-89, 1 fig., 1938. ISIS

Launay, L. de. Cent nouvelles lettres d'AMPÈRE. *Bulletin de la Société des Amis d'*ANDRÉ-MARIE AMPÈRE, 280-84, no. 9, 1938. ISIS

Lippmann, Edmund O. von. Vor hundert Jahren (Nr. XVIII). *Die Deutsche Zuckerindustrie*, Nr. 1, S. 82, 1939. ISIS

Nielsen, J. Rud. HANS CHRISTIAN OERSTED (1777-1851). Scientist, humanist, and teacher. *American Physics Teacher* 7, 10-22, port., 4 figs., 1939. ISIS

Although OERSTED is known to the world as the discoverer of electromagnetism, " in Denmark he is remembered with equal gratitude as a great teacher and exponent of physical science, and as the founder of the Royal Technical College and other institutions which have contributed to the enlightenment and welfare of the country." OERSTED's philosophical writings are here analysed in detail (his doctor's thesis was on KANT's aesthetics) and in addition to an account of his scientific work, his poetic writings are also discussed. Although OERSTED wrote many poems, the only one to achieve any fame was *The Airship* (1836), " in which he attempted to describe the rich and peaceful life that may be attained through the proper cultivation and application of the natural sciences." The very wide scope of OERSTED's writings makes them invaluable as source materials for the status of physical science and philosophy in the first half of the nineteenth century. I B. C.

Patterson, T. S. The discovery of the optical rotatory power of tartaric acid. *Annals of Science* 3, 431-34, 1938. ISIS

Tandberg, John. TEGNÉR und die Physik. *Lychnos* 372-87, 3 fig., 1938 (in Swedish with German summary). ISIS

" Kürzlich sind die Aufzeichnungen gefunden worden, die der grosse

schwedische Dichter ESAIAS TEGNÉR (1782-1846) als Student in Lund nach dem Physikkolleg des Professor PEHR TEGMAN gemacht hatte. Der Verf. berichtet im vorliegenden Aufsatz über ihren Inhalt und legt dar, wie sich die physikalischen Kenntnisse TEGNÉRS in seiner Dichtung widerspiegeln."

C. — *Natural sciences*

Aschoff, Ludwig ; Zaunick, Rudolph. LORENZ OKEN und die Universität Freiburg i.Br. Erster Abschnitt einer für die Gesellschaft Deutscher Naturforscher und Ärzte bearbeiteten Quellensammlung. Aus Leben und Werk von LORENZ OKEN dem Begründer der deutschen Naturforscherversammlungen. *Archiv für Geschichte der Medizin* 31, 365-403, 1938. ISIS

Brown, Ruth R. GEORGE CATLIN's portraits of North American Indians. *Papers in honor of* ANDREW KEOGH, p. 157-62, 1938. ISIS

Dobell, Clifford. C. G. EHRENBERG (1795-1876). A biographical note. *Parasitology* 15, 320-25, port., 1923. ISIS

Du Bois-Reymond, Emil (1818-96). Jugendbriefe von EMIL DU BOIS-REYMOND an EDUARD HALLMANN. Zu seinem hundertsten Geburtstag dem 7. November 1918, herausgegeben von ESTELLE DU BOIS-REYMOND. 155 p. Berlin, REIMER, 1918. ISIS

This book, containing letters written by the founder of electrophysiology in his youth (age 21 to 32), escaped attention for they appeared at a very unfortunate time. They reveal a charming personality but seem very remote to-day, though they were written only a century ago. Strangely enough, many earlier documents seem less remote to me. G. S.

Eyles, V. A. ; Eyles, Joan M. On the different issues of the first geological map of England and Wales. *Annals of Science* 3, 190-212, 4 pl., 3 fig., 1938. ISIS

Fabricius, J. Chr. Systema glossatorum (Brunovici, 1807). Im Anhang : K. ILLIGER : Die neueste Gattungs-Eintheilung der Schmetterlinge aus den Linnéischen Gattungen Papilio und Sphinx. J. CHR. FABRICIUS : Rechenschaft an das Publicum über seine Classification der Glossaten. Herausgegeben von FELIX BRYK. XII+112+13+14 p. Neubrandenburg, FELLER, 1938. ISIS

Geiser, S. W. A century of scientific exploration in Texas, part Ib : 1820-1880. *Field & Laboratory* 7, 29-52, 1939. ISIS

" The present paper gives biographical notes of 192 naturalists not included

in my 1937 book (*Isis* 29, 129-32), and thus brings the total number of naturalists up to 343. I believe that this approaches the total number for the 1820-80 period which we may hope future investigations to bring to light. Of these naturalists, approximately one-fourth were of German birth. They came into Texas in the German mass-migrations of 1831-61, when political situations in the homeland drove an unduly large number of liberal-minded and well-educated men with scientific background out of Germany. Some of the best trained of these early naturalists belonged to the German group."

Melson, Everett White. SCHWANN's cell-theory. The basis of one hundred years investigation of vital processes. *Current Science* 7, 267-70, 1938. ISIS

Meyer, A. W. A summary of VON BAER's *Commentar*. *Bulletin of the Institute of the History of Medicine* 6, 1031-40, 1938. ISIS

Miller, Hugh (1802-56). Commemoration at Cromarty. By T. S. W., *Nature* 142, 696-97, 1938. ISIS

Rauther, Max. CARL FRIEDRICH KIELMEYER zu Ehren. Worte bei der Enthüllung einer Gedenktafel in der Württembergischen Naturaliensammlung zu Stuttgart am 18. September 1938. *Archiv für Geschichte der Medizin* 31, 345-50, 1 fig., 1938. ISIS

Seifriz, William. The centenary of the cell theory. *Chronica botanica* 4, 485-87, 1938. ISIS

D. — *Medical sciences*

Chauffard, A. L'argumentation d'une thèse de professorat en 1812. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 154-55, Évreux, 1922. ISIS

Apropos of DUPUYTREN.

Chinard, Gilbert. LAËNNEC and CHATEAUBRIAND. *Bulletin of the Institute of the History of Medicine* 7, 95-96, 1939. ISIS

Collins, Sir W. J. The CHADWICK chapter in the history of medicine. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 66-72, Antwerp, 1923. ISIS

Edgar, Irving I. IGNATZ PHILIPP SEMMELWEIS. Outline for a biography. *Annals of Medical History* 1, 74-96, 3 fig., 1939. ISIS

Fosseyeux, Marcel. L'Institut Historique de Paris et l'histoire de la médecine, 1834-1846. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 96-103, Anvers, 1927. ISIS

Gautier, P. La thèse de RILLIET et la fièvre typhoide chez l'enfant. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 63-65, Genève, 1926. ISIS

Hanzlik, P. J. PURKINJE's pioneer self-experiment in psychopharmacology. *California and Western Medicine*, 49, 52-142, 1938. ISIS

Excellent survey of the general work of J. E. PURKINJE (1787-1869), the great Czech physiologist and pharmacologist. His self-experiments in pharmacology were critical and significant. He studied especially the action of belladonna and digitalis on the eye. C. D. L.

Herrick, James B. ROBERT ADAMS, surgeon, and his contributions to cardiology. *Annals of Medical History* 1, 45-49, 1939. ISIS

Jones, Harold Wellington. A hospital inspector's diary. Being an account of the journey of TOBIAS WATKINS, Assistant Surgeon General, U.S. Army, in the year 1818. *Bulletin of the History of Medicine* 7, 210-35, 1939. ISIS

Menetrier, Pierre. Notes pour servir à une histoire de l'humorisme, d'après un manuscrit inédit de GABRIEL ANDRAL. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet 1927), p. 144-50, Anvers, 1929. ISIS

Mettler, Cecelia C. Georgia degreed physicians previous to 1830. *Journal of the Medical Association of Georgia* 28, 43-46, 1939. ISIS

Mozołowski, Jędrzej Śniadecki (1768-1838) on the cure of rickets. *Nature* 143, 121, 1939. ISIS

Rosen, George. A note on the reception of the stethoscope in England. *Bulletin of the History of Medicine* 7, 93-94, 1939. ISIS

Spanopulos, Georg. WILHELM HUFELAND (1762-1836) und der griechische Freiheitskampf. *Die Medizinische Welt*, Nr. 15, 3-6, 1938. ISIS

Van Andel, M. A. Cholera-prophylaxis voor honderd jaar. *Bijdragen tot de geschiedenis der geneeskunde* 18, 313-20, 1938. ISIS

Wrzosek, Adam ; Wierzbicki, Romuald. Premières applications de l'auscultation en Pologne. (Contribution à l'histoire de l'influence de la science française sur la médecine en Pologne). *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 180-83, Genève, 1926. ISIS

Wrzosek, Adam. ROBERT REMAK et la science polonaise. Contribution à l'histoire de la médecine en Pologne. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 160, Genève, 1926. ISIS

XIXth century (second half)

A. — *Mathematics*

Bell, Eric Temple. Fifty years of algebra in America, 1888-1938. *American Math. Soc. Semicentennial Publications*, Vol. 2 (Semicentennial addresses of the Am. Math. Soc.), p. 1-34, New York, Am. Math. Soc., 1938. ISIS

Birkhoff, George D. Fifty years of American mathematics. *Science* 88, 461-67, 1938. ISIS

Opening portion of an address delivered at the semicentennial celebration of the American Mathematical Society, New York City, September 1938. I B. C.

Birkhoff, G. D. Fifty years of American mathematics. *American Math. Soc. Semicentennial publications*, Vol. 2 (Semicentennial addresses of the Am. Math. Soc.), p. 270-315, New York, Am. Math. Soc., 1938. ISIS

An unusual account, rich in personal recollections and in the materials for the future historian of mathematics. It is indeed good fortune to have a personal account as complete and authoritative as is this one, by as eminent a mathematician as Prof. BIRKHOFF. I B. C.

Douglas, Jesse. The problem of PLATEAU. *Scripta Mathematica* 5, 159-64, 1 fig., 1938. ISIS

Godeaux, Lucien. Notice sur CONSTANTIN LE PAIGE (1852-1939). *Annuaire de l'Acad. r. de Belg.*, 105, 239-69, port., bibliogr., 1939. ISIS

Humbert, Pierre. MAURICE D'OCAGNE (1862-1938). *Rev. des quest. scientif.* 5, 17-27, 1939. ISIS

Kraus, Charles A. JOSIAH WILLARD GIBBS. *Science* 89, 275-82, 1939. ISIS

Langer, R. E. JOSIAH WILLARD GIBBS. *American Mathematical Monthly* 46, 75-84, 1939. ISIS

B. — *Physical sciences and technology*

Adams, Walter S. GEORGE ELLERY HALE (1868-1938). *Astrophysical Journal* 87, 369-88, port., 1938. ISIS

Anschütz, Richard. AUGUST KEKULÉ. Bd. I : Leben und Wirken, 732 S., Titelbild, 119 Abb., 1 Faks. Bd. II : Abhandlungen, Berichte, Kritiken, Artikel, Reden, 976 S., 5 Abb., 3 Taf. Berlin, Verlag Chemie. ISIS

Reviewed by MAX SPETER, *Isis* 29, 442-43, 1938.

Baldwin, F. G. C. The history of the telephone in the United Kingdom [cheaper edition]. XXVI+728 p., 75 pl. London, CHAPMAN and HALL, 1938. ISIS

Reviewed by L. E. C. H., *Nature* 143, 185, 1939.

Fleming, Sir Ambrose. Physics and the physicists of the eighteen seventies. *Nature* 143, 99-102, 1939. ISIS

Fresa, Alfonso. L'astronomo P. GIOVANNI BOCCARDI (1859-1936). *R. Osservatorio Astronomico di Torino, Annali della Missione*, 44, appendice, 32 p., Roma, 1938. ISIS

Hertz, Heinrich (1857-94). *Isis* 29, 415, 1938. ISIS

(Le Chatelier, Henry). Séance en l'honneur de HENRY LE CHATELIER du 24 avril, 1937. Allocution de M. EMILE PICARD. *Thalès* 3 (1936), 9-11, Paris, ALCAN, 1938. ISIS

Quignon, G. Le monument HOUZEAU à Mons. *Ciel et Terre*, 54, 153-56, 1938. ISIS

Russell, Alexander. LORD KELVIN. VI+163 p., 8 illus. London, BLACKIE, 1938. ISIS

(Schiaparelli, G. V.). Le opere di G. V. SCHIAPARELLI. Pubblicate per cura della reale specola di Brera. Tomo IX, 499 p. Milano, HOEPLI, 1939. ISIS

Speter, Max. "Vater KOPP" Bio-, Biblio- und Psychographisches von und über HERMANN KOPP (1817-1892). *Osiris* V, 392-460, 1938. ISIS

Biographical studies on the great historian of chemistry H. M. KOPP (1817-92) with portraits, facsimiles, largely based on original documents. G. S.

(Thomson, Elihu). *Science* 89, 187-91, 1939. ISIS

Papers read at a commemoration meeting by W. D. COOLIDGE and by KARL T. COMPTON.

Weil, E. Some bibliographical notes on the first publication on the ROENTGEN rays. *Isis* 29, 362-65, 1938. ISIS

C. — *Natural sciences*

Bower, F. O. Sixty years of botany in Britain (1875-1935). Impressions of an eye-witness. VII+112 p., frontispiece, 13 illus. London, MACMILLAN, 1938. ISIS

Contents : 1. Home; 2. Repton School, 1868-1874; 3. Cambridge, 1874-1879; 4. Wanderjahre; 5. London, 1880-1885; 6. Glasgow University in 1885 and after; 7. Dramatis personae; 8. The Oxford Press and the Annals of Botany; 9. Fossil botany; 10. The emergence of pure physiology; 11. The morphological kaleidoscope; 12. Past-present-future.

Cohn, Ferdinand. Bacteria. The smallest of living organisms (1872). Translated by CHARLES S. DOLLEY (1881). Introduction by MORRIS C. LEIKIND. 44 p., frontispiece. Baltimore, Johns Hopkins Press, 1939 ($1.00). ISIS

Says M. C. LEIKIND : "When FERDINAND COHN published his essay in 1872 entitled, 'Über die Bacterien, die Kleinsten Lebenden Wesen,' KOCH was still an unknown physician. PASTEUR was in the midst of his brilliant if somewhat erratic studies on fermentations and spontaneous generation and LISTER had only just begun the development of antiseptic surgery. There is an impression current among present day students of bacteriology that the real beginning of their science dates from 1876, when KOCH published his now classic paper on Anthrax. This paper is without question a milestone but it is historically incorrect to confuse a milestone with a starting point. Bacteriology was already 200 years old in 1876 and the history of that period explains much of what occurred after the beginning

of its third century. It is, I believe, not too strong a statement to say that PASTEUR and KOCH were actually riding the crest of a tidal wave. A basis for such an opinion will be found in this paper by COHN which it is my privilege to introduce. This essay on 'The Bacteria' is a brief but comprehensive outline of the early history of the study of microbes. In masterly fashion the author sketches the development of our knowledge from the day when the immortal LEEUWENHOEK first saw his 'little animals', until his own time. We have here a brilliant summary of the position of bacteriological studies as they were considered just before KOCH opened what has been called by some historians the Golden Age of Bacteriology."

Ellsberg, Edward. Hell on ice : the saga of the 'Jeannette'. x+366 p., maps. London, HEINEMANN, 1938. ISIS

Reviewed by A. S., *Geographical Journal* 92, 373-74, 1938. Disastrous attempt to reach the North Pole by way of the Bering Sea in 1879. C. W. A.

Guglielmini, Tito. TORQUATO TARAMELLI geologo e patriotta pavese. *Rivista di storia delle scienze mediche* 29, 216-17, 1938. ISIS

Hatch, Melville H. LOUIS F. HENDERSON, honorary member of *Phi Sigma*. *The Biologist* 15, 5-8, 1933. ISIS

Hatch, Melville H. THOMAS LINCOLN CASEY as a coleopterist. *Entomological news* 37, 175-202, 1926. ISIS

Hertwig, Richard von (1850-1937). Obituary by CLIFFORD DOBELL. *Proceedings of the Linnean Society of London*, session 150, pt. 4, 1937-38, p. 319-23. ISIS

Lacroix, Alfred. Notice historique sur quatre botanistes, membres ou correspondants de l'Académie des Sciences, ayant travaillé pour la France d'Outre-Mer de la fin du siècle dernier à nos jours. Lecture faite en la séance annuelle du 19 décembre, 1938. 54 p. Paris, GAUTHIER-VILLARS, 1938. ISIS

Notices relatives à HENRI LECOMTE (1856-1934), HENRI PERRIER DE LA BÂTHIE (1873-), EDOUARD HECKEL (1843-1916) et HENRI JUMELLE (1866-1935). G. S.

(Margerie, Emmanuel de). Notice sur les travaux scientifiques de EMMANUEL DE MARGERIE. 216 p. Mâcon, PROTAT frères, 1938. ISIS

This is a model of its kind, a book containing all the objective elements of a scientific biography, admirably ordered and indexed. If the historian of science had such a publication ready for every great man of science, his

task would be considerably simplified; and it would be easier for him to make accurate statements. M. DE MARGERIE's activities have been extremely varied yet dominated by a sufficiently strong purpose to remain unified. The chronological list of publications, 281 items dated from 1882 to 1837, is followed by an analysis of them subject by subject. This begins with a synthesis admirably clear, forceful, yet modest. The first words are : " Mes parents ne m'ont jamais envoyé au Collège et je ne suis pas bachelier. Je suis entré à la Société géologique de France en 1877..." The analysis of his fifty years of ceaseless work in geology and geography is divided into nineteen sections, one of which is the history of geography and geology (p. 183-94). The only objective document lacking is a portrait which the author's friends, scattered all over the world, would have been very happy to have. We trust that this study, however long it already is, is not final, and that it will be necessary later to publish a supplement. The supplement should include at least one portrait. G. S.

Mauriac, Pierre. La figure tourmentée de CLAUDE BERNARD. *Mercure de France*, 287, 278-88, 1938. ISIS

Nuttall, George Henry Falkiner (1862-1937). Biography and bibliography by G. S. G.-S., and D. K. in *Parasitology* 30, 403-18, port., 1938. ISIS

Oehser, Paul H. WILLIAM BREWSTER : New England naturalist. *Science* 89, 198-99, 1939. ISIS

Olmsted, J. M. D. CLAUDE BERNARD, physiologist. XVI+272 p. New York, HARPER, 1938. ISIS

Reviewed by M. F. ASHLEY-MONTAGU, *Isis* 29, 440-41, 1938.

Sandow, Alexander. Social factors in the origin of Darwinism. *Quarterly Review of Biology* 13, 315-26, 1938. ISIS

" This impact of evolutionary thought on 19th century culture is an oft-told story. But it does not seem to be as generally recognized that the origin of Darwinism was in many ways an out-growth of social conditions similar to those it affected. It is the purpose of this essay to discuss certain aspects of this relation, to trace the influence of some of the more important non-biological social factors on the maturation of the doctrines of evolution into what became known as Darwinism."

Swinnerton, A. C. EDWARD ORTON, geologist. *Science* 89, 373-78, 1939. ISIS

West, Geoffrey. CHARLES DARWIN. A portrait. XIV+359 p., 8 illus. New Haven, Yale University Press, 1938 ($3.50). ISIS

Excellent book, well documented, well thought out, well written. The

final chapter is devoted to an able discussion of the social implications of Darwinism, concluding : " DARWIN was incomplete, and Darwinism accordingly inadequate as a philosophy by which men may live. It was releasing, but only as LINCOLN released the American negro slaves—from one prison into another, and in effect in each case the same, that of naked industrialism, an unrestrained materialism. That is the inevitable fate of every generalization. Its truth first releases; finally its falsity imprisons. DARWIN delivered his generation from the Egypt of an oppressive anthropomorphic theology. Men did not understand in the moment of their liberation that a mechanomorphic materialism might prove even more confining. What they need to realize is the transitory nature of every vision of the universe : scientific, poetic, religious—all are symbolic, not real, and reality alone endures. It is ill to make, as HUXLEY said, the heresies of one generation the superstitions of another." G. S.

D. — *Medical sciences*

Bouchacourt, L. Présentation du premier modèle de forceps à branches parallèles de CHASSAGNY (de Lyon). *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 552-54, 1 fig., Évreux, 1922. ISIS

Givhan, E. G., Jr. CARLOS FINLAY (1833-1910). *Annals of Medical History* 1, 189-93, 1939. ISIS

Gwyn, Norman B. The letters of a devoted father to an unresponsive son, student of medicine at McGill and London. Being the letters of OSLER's great inspiration, W. A. JOHNSON to his son JAMES, M.D.C.M., McGill, 1876 ; L.S.A., London, 1881; L.F.P.S., Glasgow, 1906, ordained priest, 1916. *Bulletin of the History of Medicine* 7, 335-51, port., 1939. ISIS

Le Gendre, Paul. CHARLES BOUCHARD étudiant à Lyon (1855-1861). *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 390-410, Évreux, 1922. ISIS

Major, Ralph H. KARL VIERORDT. *Annals of Medical History* 10, 463-73, 1 port., 3 fig., 1938. ISIS

Petridis, Paylos. La découverte du bacille de choléra en 1883 à l'Hôpital Grec d'Alexandrie. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 348-50, Anvers, 1929. ISIS

" Le bacile du choléra a été découvert par ROBERT KOCH au laboratoire de l'Hôpital Grec d'Alexandrie en 1883."

MacDermot, H. E. Sir THOMAS RODDICK : his work in medicine and public life. XIII+160 p. Toronto, MACMILLAN, 1938. ISIS

Sir THOMAS RODDICK, born in Newfoundland in 1846, was long identified with medical life in Montreal and throughout Canada. He was of a group, trained in the Montreal General Hospital, of whom Sir WILLIAM OSLER is perhaps the best known. RODDICK's chief fame rests upon his early recognition of LISTER's antiseptic principles as applied to surgery. These he first used in 1877 and, in the following two years, so excellent were his results that whatever skepticism regarding Listerism there had been in Montreal was almost entirely removed. Much later in life he saw through the Canadian Parliament, of which he was a member, a bill, passed in 1911, setting up the Dominion Medical Council, thus assuring uniform medical registration in Canada. He died in 1923, respected for his pioneer efforts in surgery, his work for higher standards of medical education and practice, and for the considerable influence he exercised on a generation of men, students of medicine at McGill University. Dr. MACDERMOT's short, but pleasing, biography records in adequate terms the record of one of Canada's most outstanding medical sons. H. R. V.

Rosen, George. CLAUDE BERNARD's work on experimental pneumoconiosis. *Bulletin of the History of Medicine* 7, 412-16, 1939. ISIS

Roth, George B. An early American pharmacologist HORATIO C WOOD (1841-1920). *Isis* 30, 38-45, 1 pl., 1939. ISIS

Rouzaud, A. BOURNEVILLE et le " Progrès Médical". *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 88-91, Anvers, 1927. ISIS

Speter, Max. PAUL DORVEAUX (1851-1938). *Isis* 30, 46-51, 1 pl. (port.), 2 facs., 1939. ISIS

Torkomian, Vahram H. Liste des médecins arméniens diplomés de la Faculté de Paris de 1843 à 1921. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 479-90, Évreux, 1922. ISIS

Townsend, Jonathan M. FRANCIS PEYRE PORCHER, M.D. (1824-1895). *Annals of Medical History* 1, 177-88, 1939. ISIS

Van der Kley, J. J. SCHROEDER VAN DER KOLK's boek over krankzinnigheid, als voorbeeld van eenvoudige degelijke Nederlandsche wetenschap. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 286-88, Anvers, 1929. ISIS

White, William. The biographical essays of Sir WILLIAM OSLER and their relation to medical history. *Bulletin of the History of Medicine* 7, 28-48, Baltimore, 1939. ISIS

E. — *Alia*

Boardman, Philip L. Esquisse de l'œuvre éducatrice de PATRICK GEDDES, suivie de trois listes bibliographiques. 203 p., port. Montpellier, Imprimerie de la Charité, 1936. ISIS

Biography of a great educator and a great man. It was my privilege to know Sir PATRICK and we had endless discussions together at the time of his last visit to Cambridge. There are many places in India, Edinburgh, Paris, Montpellier, etc., where his memory will be kept green and where his influence will continue, and this book will help to perpetuate his generous ideals. The author is preparing a fuller account of this extraordinary personality.
G. S.

(Buffalo). Seventy-five years. A history of the Buffalo Society of Natural Sciences, 1861-1936. 204 p., 53 pl., 3 plans. *Bulletin of the Buffalo Society of Natural Sciences*, 18, 1938. ISIS

This is an historical account of one of the pioneer natural history societies in an important city of the United States covering a period in which many such enterprises were started only to fade away. The reasons why the society at Buffalo has flourished seem to be the devotion of a group of public spirited citizens interested in science, the leadership of local amateur and professional specialists, and the integration of the organization into the educational enterprises of the city. The Museum with its fine exhibits, the housing of thescientific collections of local specialists, and the *Bulletin* affording an outlet for publication have united to make this institution a model local scientific enterprise. The history is embellished with portraits of its leaders and photographs of its outstanding exhibits. A bibliography of its publications is included which includes the names of noted entomologists, ichthyologists, ornithologists, paleontologists, and anthropologists.
C. A. K.

Schliemann, Heinrich. Briefe von, gesammelt und mit einer Einleitung in Auswahl herausgegeben von ERNEST MEYER. Geleitwort von WILHELM DÖRPFELD. 362 p., 3 pl. Berlin, DE GRUYTER, 1936. ISIS

Reviewed by CARL W. BLEGEN, *American Journal of Archaeology* 42, 544-54, 1938.

Shoen, Harriet H. Prince ALBERT and the application of statistics. *Osiris* V, 276-318, 1 pl., 1938. ISIS

Prince ALBERT OF SAXE-COBURG (the future Prince Consort) was a pupil

of QUETELET (*Isis* 23, 6-24, 1935), who taught him the fundamental value of statistics for the art of government. Prince ALBERT remembered these lessons, witness his address at the opening of the Fourth International Congress of Statistics (London, 1860) reprinted in this article, and his correspondence with his old master, relevant extracts from which are quoted in extenso. G. S.

XXth century

A. — *Mathematics*

Lamb, Sir Horace (1849-1934). Obituary notice by R. T. GLAZEBROOK and A. E. H. LOVE. *Obituary Notices of Fellows of the Royal Society* 1, 375-92, port., 1935. ISIS

Orr, William McFadden (1866-1934). Obituary notice by A. W. CONWAY. *Obituary Notices of Fellows of the Royal Society* 1, 559-62, port., 1935. ISIS

B. — *Physical sciences and technology*

Baker, Herbert Brereton (1862-1935). Obituary Notice by J. F. THORPE. *Obituary Notices of Fellows of the Royal Society* 1, 523-26, port., 1935. ISIS

Barlow, William (1845-1934). Obituary notice by W. J. POPE. *Obituary Notices of Fellows of the Royal Society* 1, 367-70, port., 1935. ISIS

Cohen, Julius Berend (1859-1935). Obituary notice by H. S. RAPER. *Obituary Notices of Fellows of the Royal Society* 1, 503-13, port., 1935. ISIS

Cotton, Aimé. Discours prononcé à l'Académie des Sciences de Paris, séance publique annuelle du lundi 19 décembre, 1938. ISIS

Cross, Charles Frederick (1855-1935). Obituary notice by E. F. ARMSTRONG. *Obituary Notices of Fellows of the Royal Society* 1, 459-64, port., 1935. ISIS

Evans, Ivor B. N. Man of power. The life story of Baron RUTHERFORD OF NELSON, O.M., F.R.S., 1871-1937. 288 p. 11 illus. London, PAUL, 1939. ISIS

Ewing, James Alfred (1855-1935). Obituary notice by R. T. GLAZEBROOK. *Obituary Notices of Fellows of the Royal Society* 1, 475-92, port., 1935. ISIS

Garbedian, H. Gordon. ALBERT EINSTEIN, maker of universes. x+328 p., 16 illus. New York, FUNK & WAGNALLS, 1939. ISIS

Hicks, William Mitchinson (1850-1934). Obituary notice by S. R. MILNER. *Obituary Notices of Fellows of the Royal Society* 1, 393-99, port., 1935. ISIS

McLennan, Sir John Cunningham (1867-1935). Obituary notice by A. S. EVE. *Obituary Notices of Fellows of the Royal Society* 1, 577-83, port., 1935. ISIS

(Ruska, Julius). *Osiris* V, 601 p., 9 pl., frontispiece, 60 facs., 1938, dedicated to him; includes his portrait, biography by PAUL KRAUS, and bibliography. ISIS

Schuster, Sir Arthur (1851-1934). Obituary notice by G. C. SIMPSON. *Obituary Notices of Fellows of the Royal Society* 1, 409-23, port., 1935. ISIS

Van Mieghem, J. Le premier exemple d'analyse d'un cyclone dans l'espace et dans le temps. *Institut royal météorologique de Belgique, Miscellanées*, fasc. 2, 20 p., 1939. ISIS

Walker, Sir James (1863-1935). Obituary notice by J. KENDAL. *Obituary Notices of Fellows of the Royal Society* 1, 537-49, port., 1935. ISIS

C. — *Natural sciences*

Black, Davidson (1884-1934). Obituary notice by G. E. SMITH. *Obituary Notices of Fellows of the Royal Society* 1, 361-65, port., 1934. ISIS

Cannon, Walter B. The story of the development of our ideas of chemical mediation of nerve impulses. *American Journal of the Medical Science* 188, 145-59, 1934. ISIS

Contient (p. 149) le récit des circonstances de la découverte qui valut à OTTO LOEWI le Prix Nobel; document d'une grande importance pour la psychologie de la découverte et de la pensée scientifique. J. P.

Cockayne, Leonard (1855-1934). Obituary notice by A. W. HILL. *Obituary Notices of Fellows of the Royal Society* 1, 443-57, port., 1935. ISIS

David, Sir Tannatt William Edgeworth (1858-1934). Obituary notice by D. MAWSON. *Obituary Notices of Fellows of the Royal Society* 1, 493-501, port., select bibliography, 1935. ISIS

De Vries, Hugo (1848-1935). Obituary notice by A. D. HALL. *Obituary Notices of Fellows of the Royal Society* 1, 371-73, port., 1935. ISIS

Dixey, Frederick Augustus (1855-1935). Obituary notice by E. B. POULTON. *Obituary Notices of Fellows of the Royal Society* 1, 465-74, port., 1935. ISIS

Dudley, Harold Ward (1887-1935). Obituary notice by H. H. DALE. *Obituary Notices of Fellows of the Royal Society* 1, 595-606, port., bibliography, 1935. ISIS

Fairchild, David. The world was my garden. Travels of a plant explorer. Assisted by ELIZABETH and ALFRED KAY. XIV+494 p., pls. New York, SCRIBNER's, 1938. ISIS

This is an extremely interesting autobiography, the story of one of the great American benefactors. A man who travelled all over the world to find useful and beautiful plants which might be introduced into the United States; many of these plants were successfully introduced and have become precious parts of our national patrimony. The book is well illustrated and is a pleasure to read, especially for plant lovers. G. S.

Ladeuze, Mgr. P.; Marchal, E. Le Chanoine VICTOR GRÉGOIRE (1870-1938). *Rev. des Quest. scientif.* 5, 5-16, 1939. ISIS

Lapicque, Louis. L'isochronisme neuro-musculaire comme fait empirique. *Thalès* 3, (1936), 12-14, Paris, ALCAN, 1938. ISIS

Macleod, John James Rickard (1876-1935). Obituary notice by E. P. CATHCART. *Obituary Notices of Fellows of the Royal Society* 1, 585-89, port., 1935. ISIS

Pembrey, Marcus Seymour (1868-1934). Obituary notice by C. G. DOUGLAS. *Obituary Notices of Fellows of the Royal Society* 1, 563-67, port., 1935. ISIS

The Piltdown man discovery. Unveiling of a monolith memorial. *Nature* 142, 196-97, 1 fig., 1938. ISIS

Ramon y Cajal, Santiago (1852-1934). Obituary notice by C. S. SHERRINGTON. *Obituary Notices of Fellows of the Royal Society* 1, 425-41, port., 1935. ISIS

A notice of exceptional interest as an analysis of character. C. W. A.

Sharpey-Schafer, Sir Edward Albert (1850-1935). Obituary notice by LEONARD HILL. *Obituary Notices of Fellows of the Royal Society* 1, 401-07, port., 1935. ISIS

Thomas, Herbert Henry (1876-1935). Obituary notice by A. HARKER. *Obituary Notices of Fellows of the Royal Society* 1, 591-94, port., 1935. ISIS

D. — *Medical sciences*

Bradford, Sir John Rose (1863-1935). Obituary notice by T. R. ELLIOTT. *Obituary Notices of Fellows of the Royal Society* 1, 527-35, port., 1935. ISIS

(Cushing, Harvey). The eight annual meeting of the HARVEY CUSHING Society celebrating HARVEY CUSHING's seventieth birthday, April 8, 1939. Yale University School of Medicine, New Haven, Conn., April 6-8, 1939. ISIS

De Busscher, Jacques. ALFRED ADLER et la psychothérapie. *Rev. de l'Univ. de Bruxelles* 44, 60-68, 1938-39. ISIS

Diepgen, Paul. Die Freiburger Medizinische Fakultät am Anfang unseres Jahrhunderts. *Deutsche Medizinische Wochenschrift*, Nr. 39, p. 1-12, 1938. ISIS

(Diepgen, Paul). Medizin und Kultur. Gesammelte Aufsätze von PAUL DIEPGEN. Zu seinem 60. Geburtstag am 24. November 1938, herausgegeben von W. ARTELT, E. HEISCHKEL, J. SCHUSTER. VII+309 p., frontispiece. Stuttgart, ENKE, 1938. (RM. 21). ISIS

Collection of DIEPGEN's medico-historical essays put together for the celebration of his 60th birthday, with a portrait, a bibliography, and an index. The essays deal with the history of medicine in general, and with such

personalities as ALBRECHT HALLER, ARNOLDO DA VILLANOVA, G. B. MORGAGNI, C. W. HUFELAND, NOVALIS, ALFRED HEGAR. Congratulations to the jubilarian and best wishes for his health and work. G. S.

Diepgen, Paul. TIBERIUS VON GYÖRY DE NÀDUDVAR zum Gedenken. *Deutsche Medizinische Wochenschrift* Nr. 10, S. 352, 1938. ISIS

Dreyer, Georges (1873-1934). Obituary notice by S. R. DOUGLAS. *Obituary Notices of Fellows of the Royal Society* 1, 569-76, port., bibliography, 1935. ISIS

Economo, Baroness Constantin von; Wagner-Jauregg, J. von. Baron CONSTANTIN VON ECONOMO (1876-1931). His life and work. Translated from the second German edition by RAMSAY SPILLMAN. x+126 p., 5 pl., ports., 19 fig. Burlington, Vt., Free Press Interstate Printing Corp. 1937. ISIS

Reviewed by CHARLES A. KOFOID, *Isis* 29, 443-44, 1938.

Hult, Olof. Zu seinem 70. Geburtstag am 2. XII. 1938, von PAUL DIEPGEN. *Münchener Medizinische Wochenschrift* Nr. 48, S. 1888, 1938. ISIS

Mayrhofer, Bernhard (1868-1938). Obituary by PAUL DIEPGEN. *Münchener Medizinische Wochenschrift* Nr. 45, 3 p., 1938. ISIS

Smith, Theobald (1859-1934). Obituary notice by G. H. F. NUTTALL. *Obituary Notices of Fellows of the Royal Society* 1, 515-21, port., 1935. ISIS

Sudhoff, Karl (1853-1938). Nachruf auf KARL SUDHOFF, von WALTER VON BRUNN. *Archiv für Geschichte der Medizin* 31, 337-42, port., 1938. ISIS

Tietsch, F. L. Self-portrait of FIELDING H. GARRISON. Autobiographical excerpts compiled from his letters. *Bulletin of the History of Medicine* 7, 365-73, Baltimore, 1939. ISIS

Wallquist, Einar. Can the doctor come? Translated from the Swedish by PAULA WIKING. Illustrated by BIP PARES. 221 p. Printed in London by the Camelot Press for HODDER & STOUGHTON, 1936 (10/6). ISIS

At a time when the dictates of justice and mercy are publicly flouted in

some " civilized " countries like Germany and Italy, it is refreshing to read this tale of quiet heroism in the service of humanity, the life of a Swedish doctor in the arctic regions. The author was born in 1896 in Dalsland, took his matriculation examination in Upsala, 1913, became an M.M. in 1922 and has since practised at Arjepluog many miles north of the Arctic Circle. In addition to this book now available in English, he wrote two others : *Lappmarksdoktor*, 1936 (A doctor in Lappmark) and *Lappmarksår*, 1937 (Years in Lappmark) which have been very well received by the highly educated Swedish public. The author is obviously a very gentle man, sensitive and generous, and his book is a document of the first importance. It is good reading in days when one almost despairs of mankind. G. S.

White, William. OSLER on SHAKESPEARE, BACON, and BURTON, with a reprint of his " Creators, transmuters, and transmitters as illustrated by SHAKESPEARE, BACON, and BURTON". *Bulletin of the History of Medicine* 7, 392-401, Baltimore, 1939. ISIS

E. — *Alia*

(Dussaud, René). Mélanges syriens offerts à Monsieur RENÉ DUSSAUD. Tome premier, XVI+487 p., pls., figs. (Haut-Commissariat de la République Française en Syrie et au Liban, Service des antiquités, Bibliothèque archéologique et historique, 30). Paris, GEUTHNER, 1939. ISIS

Greenwood, T. Pope PIUS XI and his scientific interests. *Nature* 143, 274, 1939. ISIS

(Keogh, Andrew). Papers in honor of ANDREW KEOGH, librarian of Yale University, by the staff of the library, 30 June 1938. IX+492 p. New Haven, 1938. ISIS

PART II

HISTORICAL AND ETHNOGRAPHICAL CLASSIFICATION

I. — ANTIQUITY

1. — **ANTIQUITY** (*generalities*)

Bieber, Margarete. The history of the Greek and Roman theater. VIII+467 p. Princeton University Press, 1939 ($7.50). ISIS

In 1920 there appeared from the present author's pen a study of the history of the Greek and Roman stage,her *Denkmaeler zum Theaterwesen im Altertum*,

which immediately assumed its place as the most authoritative and the standard work on the subject with which it dealt. That work has been out of print for ten years. The present volume is a completely rewritten and greatly enlarged revision of the earlier work. It is not too much to say of it in its present form that it will long remain the definitive work on the history of the Greek and Roman stage. There is not an aspect of the subject which Dr. BIEBER leaves untouched or unillumined, and she writes not at second hand, but as an active archaeologist who has visited practically every ancient site and theatre of which she writes. Her collection of photographs which, together with the invaluable plans of ancient Greek and Roman theatres, are reproduced in this volume, numbering some 566 items, form a real iconography of the classical theatre which adds immensely to the value of this beautifully produced book. An understanding of the functioning of classical civilization, of its quality can never be complete without an appreciable acquaintance with that civilization, or civilizations, in all its phases. The drama among the Greeks and Romans of classical antiquity occupied an important place in the lives of its citizens and in the development of their civilization. First in importance among the works which deal with this aspect of the subject I would place Dr. BIEBER's great work; second place I would give to THEOCRITUS' Fifteenth Idyll for something of the "Stimmung" of the Greek theatre, and for the like service for the Roman theatre my third award would go to LOUIS COUPERUS' novel *The Comedians*. I would award a fourth place to the Princeton Univeristy Press for making this volume available in so efficient and tasteful a format and what is quite as important, at so low a price. There is thus only one work which covers the whole field of the classical theatre and that is Dr. BIEBER's truly magnificent work. Dismissed from her post by the Nazi regime, from the Directorship of the Archaeological Institute at the University of Giessen, let us hope that Dr. BIEBER may enjoy long and fruitful years in her new found home.

M. F. A.-M.

Grøn, Fr. Abortus provocatus in der Antike. *Lychnos* 311-31, 1938 (in Swedish with German summary). ISIS

Poidebard, A. Un grand port disparu, Tyr. Recherches aériennes et sous-marines, 1934-1936. Conclusion par L. CAYEUX. X+78 p., XI p., atlas, 24 pl. Paris, GEUTHNER, 1939. ISIS

Zibordi, Ferruccio. La tutelle de l'enfant dans l'empire grec-égyptien et dans l'empire romain. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 526-29, Évreux, 1922. ISIS

2. — EGYPT

Capart, Jean. Horloges égyptiennes. *Bulletin des musées royaux d'art et d'histoire* 10, 50-54, 9 fig., 1938. ISIS

Chatley, Herbert. Ancient Egyptian astronomy. *Nature* 143, 336, 1939. ISIS

Ebbell, B. Alt-Aegyptische Bezeichnungen für Krankheiten und Symptome. 65 p. (Skriften utgitt af Det Norske Videnskaps-Akademi, Oslo II. hist.-filos. Klasse no. 3, 1938). Oslo. ISIS

Reviewed by M. MEYERHOF, *Janus* 43, 75-79, 1939.

Gabra, Sami. Exploring the galleries of Hermopolis, the sacred city of Toth : work which has brought to light thousands of fine bronze ex votos and a unique papyrus of Egyptian law and geometry. *Illustrated London News*, p. 840, figs., May 13, 1939. ISIS

Says the author " While clearing the archives office we had the good fortune to find a large demotic papyrus measuring 1.8 m. by 0.50 m., in a jar thrown down among hundreds of others which were buried at the foot of the hill. It is a unique document dealing with judicial matters, a corpus of laws defining the relations between landlords and tenants, as well as rules of inheritance. This papyrus when translated and transcribed will throw much light on laws and customs in Egypt during the Graeco-Roman period. The verso deals with geometrical problems." G. S.

Guiart, Jules. L'obstétrique dans l'ancienne Égypte. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 54-63, 6 fig., Évreux, 1922. ISIS

Hemmeter, Ernst. Medizinisches aus dem alten Ägypten. *Ciba Zeitschrift* Nr. 33, 1114-39, 1936. ISIS

Ägyptens geistige Welt; Von Ärzten, Krankheiten und Heilbehandlungen; Die Einbalsamierung im alten Ägypten.

Keimer, Ludwig. Insectes de l'Égypte ancienne (études égyptologiques publiées de 1931 à 1937 dans les " Annales du service des antiquités de l'Égypte "). VIII+172 p., 26 pl., fig. Le Caire, 1938. ISIS

Reviewed by J. C., *Chronique d'Égypte* 14, 116, 1939.

Lint, J. G. de. Notice sur la nomenclature anatomique des Égyptiens au temps des anciens Pharaons. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 330-36, Évreux, 1922. ISIS

Mercier, Maurice. Le bitume a-t-il été utilisé dans la haute antiquité égyptienne? *Thalès* 3 (1936), 68-69, Paris, ALCAN, 1938. ISIS

Neugebauer, O. Die Bedeutungslosigkeit der "Sothisperiode" für die älteste ägyptische Chronologie. *Acta Orientalia* 17, 169-95, (rec. March 1939). ISIS

Neugebauer, O. Egyptian astronomy. *Nature* 143, 115, 1939. ISIS

Otto, Eberhard. Beiträge zur Geschichte der Stierkulte in Ägypten. VIII+60 p. (Unters. z. Geschichte u. Altertumskde Ägyptens, 13). Leipzig, HINRICHS, 1938. ISIS

Weynants-Ronday, Marie. Lettres inédites de MARIETTE. *Chronique d'Égypte* 14, 69-78, 1939. ISIS

Woog, Paul. Note sur la recherche du bitume dans la matière dont sont constitués deux Oushabti. *Thalès* 3 (1936), 70-82, Paris, ALCAN, 1938. ISIS

3. — BABYLONIA AND ASSYRIA

Boissier, Alfred. Mantique babylonienne et mantique hittite. 81 p., 5 pl. Paris, GEUTHNER, 1935. ISIS

Reviewed by MIRCEA ELIADE, *Zalmoxis*, Revue des études religieuses 1, 236-38, 1938.

Bortolotti, E. Prodromi di metodo matematico nei problemi babilonesi. *Scientia* 16, 305-12, 1938. ISIS

Contenau, Georges. Drogues de Canaan, d'Amurru et jardins botaniques. *Mélanges syriens offerts à M.* RENÉ DUSSAUD 1, 11-14, 1939. ISIS

Ionides, M. G. Two ancient irrigation canals in northern 'Iraq. *Geographical Journal* 92, 351-54, 1938. ISIS

One of the two, the Hafr el Fil, perhaps dating from Parthian times, is remarkable in two respects. Of the total of 20 million cubic metres of earthwork, between a quarter and a third served no purpose but to satisfy the aesthetic sense of the engineers. And throughout its length a berm of some 15 to 20 metres was left between the edge of the cut and the inner toe of the spoil-banks. This excellent disposal of the banks, with a berm held sacred when the canal was cleared of silt, contrasts with the usual practice in old canals of placing the silt on the very edge, with the result that the banks grew in steepness till the canal had to be abandoned. C. W. A.

Lutz, Henry Ludwig Fr. The concept of change in the life and thought of the Babylonians. 21 p. No place, March 1939. ISIS

Mesnil du Buisson, Le Comte du. Une tablette magique de la région du moyen Euphrate. *Mélanges syriens offerts à* M. RENÉ DUSSAUD 1, 421-34, 1 pl., 5 fig., 1939. ISIS

Olmstead, A. T. Amber statuette of ASHUR-NASIR-APAL, king of Assyria (885-860 B.C.). *Bulletin of the Museum of Fine Arts* 36, 78-83, 6 fig., Boston, 1938. ISIS

Scheil, V. Tablettes susiennes. Exercices scolaires, calcul des surfaces. *Revue d'Assyriologie* 35, 92-103, 1938. ISIS

Schiffer, S. L'astronomie Chaldéo-Hittite et la fondation de la science grecque. *Thalès* 3 (1936), 90-103, Paris, ALCAN, 1938. ISIS

Speleers, Louis. Le personnage aux pavots. *Bulletin des Musées royaux d'art et d'histoire* 10, 122-36, 10 fig., 1938. ISIS

Discussing the subject dealt with by SARTON in *Isis* 21, 8-13, 1934; 26, 95-98, 1936, and GANDZ, *Isis* 23, 245-50, 1935.

Thureau-Dangin, F. Notes assyriologiques. *Revue d'Assyriologie* 35, 105-06, 1938. ISIS

1. Histoire d'un problème babylonien; 2. " Multiplier par " dans les textes cunéiformes du temps des Séleucides.

4. — GREECE

Bortolotti, Ettore. L'infinito e l'infinitesimo nella matematica antica. 15 p. *Memorie della R. Accademia delle Scienze dell'Istituto di Bologna, classe di scienze fisiche, sezione di scienze fisiche e matematiche*, serie 9, t. 5, 1937-38. ISIS

Botsford, George Willis; Robinson, Charles Alexander, jr. Hellenic history. XIV+398 p. New York, MACMILLAN, 1939 ($4.50). ISIS

Hellenic History was first published in 1922 shortly after the death of Professor BOTSFORD, late professor of history at Columbia University. The present edition has been revised and rewritten by Professor ROBINSON, and a number of new plates, maps, and figures have been added. Altogether the book is clearly intended for the general reader as well as for the high

school and college student, though we are nowhere specifically informed upon this matter. The plates and maps in this volume seem to me to have been chosen and drawn with unusual taste and care, and the whole volume is a credit both to the authors and the publishers. M. F. A.-M.

Casson, S. Submarine research in Greece. *Antiquity* 13, 80-86, 4 pl., 1939. ISIS

Apropos of archaeological discoveries made under water off the Greek coasts. G. S.

Cawadias, Alexander. The cult of Asklepios and its rôle in the history of medicine. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 42-44, Antwerp, 1923. ISIS

Gask, G. E. Early medical schools. The cult of Aesculapius and the origin of Hippocratic medicine. *Annals of Medical History* 1, 128-57, 1939. ISIS

Gilruth, J. D. CHIRON and his pupil ASCLEPIUS. *Annals of Medical History* 1, 158-76, 6 figs., 1939. ISIS

Haberling, Wilhelm. Sportärztliches aus dem Altertum. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 48-51, Anvers, 1929. ISIS

Heath, Sir Thomas Little. Greek mathematics and astronomy. *Scripta Mathematica* 5, 215-32, 1938. ISIS

Lacroix, Léon. Une liste de noms de poissons dans une inscription béotienne. *Annuaire de l'Institut de philologie et d'histoire orientales et slaves* 6, 49-56, 1938. ISIS

Neveu, Raymond. Épidaure, ville sainte. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 97-102, Évreux, 1922. ISIS

Oliver, James H.; Maas, Paul Lazarus. An ancient poem on the duties of a physician. *Bulletin of the History of Medicine* 7, 315-23, 2 fig., Baltimore, 1939. ISIS

Panayotatou, Angélique G. Terres cuites d'Égypte de l'époque " Greco-Romaine " et maladies. *VI^e Congrès International d'Histoire*

de la Médecine (Leyde-Amsterdam, 18-23 juillet, 1927), p. 41-47, 7 pl., Anvers, 1929. ISIS

Panayotatou, Angélique G. L'hygiène et la morale chez les anciens Grecs. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 104-05, Anvers, 1927. ISIS

Panayotatou, Angélique G. L'hygiène et la danse chez les anciens Grecs. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 312-16, Antwerp, 1923. ISIS

Sévilla, H. J. L'hippiatrie grecque ancienne. Posologie de l'opium et de quelques " simples " actifs inscrits dans la thérapeutique des affections pulmonaires des équidés. *Comptes rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 37-48, Anvers, 1927. ISIS

Sévilla, H. J. L'art vétérinaire antique. Le syndrome " coliques " dans l'hippiatrie grecque. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 274-87, Antwerp, 1923. ISIS

Sévilla, H. J. L'art vétérinaire antique. Considérations sur les saignées pratiquées par les hippiatres grecs. *Comptes rendus du Deuxième Congrès International d'Histoire de la médecine* (Paris, 1921), p. 77-96, Évreux, 1922. ISIS

Torrey, Harry Beal. The evolution of mechanical ideas in ancient Greek thought. *American Naturalist* 72, 293-303, 1938. ISIS

Ver Eecke, P. Note sur une interprétation erronée d'une définition pythagoricienne de la ligne géométrique. *L'antiquité classique* 7, 271-73, 1938. ISIS

5. — ROME

Bullock, F. Mulomedicina CHIRONIS (abstract). *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 304-05, Antwerp, 1923. ISIS

Gomoiu, V. Les premières traces de médecine en Roumanie.

VI^e Congrès International d'Histoire de la Médecine (Leyde-Amsterdam, 18-23 juillet, 1927), p. 293-95, 4 figs., Anvers, 1929. ISIS

Gossen, H. Chronological table; The legacy of Greece and medical thought in ancient Rome; The physician in ancient Rome; The therapeutic methods of the Roman physician; Superstition in Roman medicine; Hygiene in ancient Rome. *Ciba Symposia* 1, 2-32, 1939. ISIS

Mazeran, Alexandre. L'outillage thérapeutique thermal à l'époque gallo-romaine. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 457-61, Évreux, 1922. ISIS

Neveu, Raymond. Les médecins et l'opinion publique à Rome dans l'antiquité. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 36-40, Anvers, 1929. ISIS

Smythe, J. A. A Roman water pipe. *Nature* 143, 119, 1 fig., 1939. ISIS

II. — MIDDLE AGES

6. — **MIDDLE AGES** (*generalities*)

Belohlavek, C. Sur les épidémies dans les pays tchèques au moyen-age. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17ht to 22nd, 1922), p. 109-13, Antwerp, 1923. ISIS

Bugiel, V. L'opuscule médiéval " De morte prologus " et son intérêt pour l'histoire de la médecine. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 158-68, Anvers, 1929. ISIS

Coomaraswamy, Ananda K. The philosophy of mediaeval and oriental art. *Zalmoxis, Revue des études religieuses* 1, 20-49, 1938. ISIS

De Lint, J. G. An obstetrical manuscript fragment. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 186-89, 1 fig., Antwerp, 1923. ISIS

Droz, E. Notice sur le manuscrit français 3887 de la Bibliothèque Nationale. *V^e Congrès International d'Histoire de la Médecine*, Genève, 20-25 juillet, 1925, p. 266-67, Genève, 1926. ISIS

" Bien que décrit dans le *Catalogue des manuscrits français* de la Bibliothèque nationale, le manuscrit 3887 semble cependant avoir échappé aux recherches des historiens de la médecine et il n'est peut-être pas inutile d'analyser son contenu. Il est tout entier formé de pièces historiques, sauf les folios 19*ro* à 36*vo* qui contiennent des recettes médicales pour le traitement de la peste. Ce sont ces recettes que je voudrais parcourir."

Fosseyeux, Marcel. Cure balnéaire et thaumaturgique des aliénés au moyen âge. *Bulletin de la Société française d'Histoire de la Médecine* 33, 21-32, 1939. ISIS

Ganzenmüller, W. Die Alchemie im Mittelalter. 240 p., 8 pl. Paderborn, Verlag der Bonifacius-Druckerei, 1938. ISIS

Hennig, Richard. Terrae incognitae : Eine Zusammenstellung und kritische Bewertung der wichtigsten vorcolumbischen Entdeckungsreisen an Hand der darüber vorliegenden Originalberichte. Bd. III, 1200-1415 n. Chr., Beginn des Entdeckungs-Zeitalters. x+389 p. Leiden, BRILL, 1938. ISIS

Jeanselme, E. De la chirurgie et de l'estimation des blessures d'après les vieilles coutumes germaniques, scandinaves et anglo-saxonnes. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 271-35, Genève, 1926. ISIS

Loomis, C. Grant. Three cases of vaginism. *Bulletin of the History of Medicine* 7, 97-98, Baltimore, 1939. ISIS

Cases taken from the lives of saints. G. S.

Mayer, Claudius F. A medieval English leechbook and its 14th century poem on bloodletting. *Bulletin of the History of Medicine* 7, 381-91, 1 fig., Baltimore, 1939. ISIS

Raymond, Paul. Remarques sur la lèpre et la syphilis en France au moyen âge. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 182-83, Évreux, 1922. ISIS

Sigerist, Henry E. Materia medica in the Middle Ages. A review. *Bulletin of the History of Medicine* 7, 417-23, Baltimore, 1939. ISIS

Simonini, Riccardo. Scrittori italiani di pediatria nel medio evo. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 473-78, Évreux, 1922. ISIS

Sudhoff, Karl. Genetische Zusammenhänge und regionale Bedingtheiten in der Medizin des 12. und 13. Jahrhunderts. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 136-43, Anvers, 1929. ISIS

Thomson, S. Harrison. Progress of medieval studies in the United States and Canada. Bulletin no. 14, 74 p. Boulder, Colorado (University of Colorado), 1939. ISIS

Thorndike, Lynn. Additional incipits of mediaeval scientific writings in Latin. *Speculum* 14, 93-105, 1939. ISIS

Thorndike, Lynn. A study in the analysis of complex scientific manuscripts. Sloane 3457 : an important alchemical manuscript. *Isis* 29, 377-92, 1938. ISIS

Wright, Edith A. Medieval attitudes towards mental illness. *Bulletin of the History of Medicine* 7, 352-56, Baltimore, 1939. ISIS

7. — BYZANTIUM

Jeanselme, E. ; Oeconomos, L. Aliments et recettes culinaires des Byzantins. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 155-68, Antwerp, 1923. ISIS

Rome, A. Un manuscrit de la bibliothèque de BONIFACE VIII (1294-1303) à la médicéenne de Florence. Note de A. PELZER. *L'Antiquité classique* 7, 261-70, 1 pl., 1938. ISIS

III. — ORIENTAL SCIENCE AND CIVILIZATION

8. — WESTERN ASIA
(including " The ancient East " in general)

Adnan, Abd-ul-Hak. La science chez les Turcs Ottomans du commencement des temps modernes jusqu'aux premières années du XVII^e siècle. *Archeion* 19, 35-61, 1938. ISIS

Reprinted in the author's book *La science chez les Turcs Ottomans* (Paris, 1939), to be reviewed later in *Isis*. G. S.

Basmadjian, K. J. Les anciens ouvrages arméniens sur la médecine. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 293-95, Évreux, 1922. ISIS

Newell, Edward Theodore. The coinage of the Eastern Seleucid mints, from SELEUCUS I to ANTIOCHUS III. 307 p., 56 pl. (Numismatic studies, 1) New York, American Numismatic Society, 1938. ISIS

Torkomian, V. Un coup d'œil sur l'histoire de la médecine en Arméno-Cilicie. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 202-06, Genève, 1926. ISIS

CENTRAL ASIA

Bacot, Jacques. La vie de MARPA le "traducteur." Suivi d'un chapitre de l'*avadâna* de l'oiseau Nîlakaṇṭha. Extraits et résumés d'après l'édition xylographique tibétaine. 115 p., frontispiece. (Buddhica, Documents et travaux pour l'étude du Bouddhisme, 7). Paris, GEUTHNER, 1937. ISIS

Jeffrey, J. Howard. An Aryan content in the Tibetan language. *Journal of the West China Border Research Society* 9, 135-59, 1937. ISIS

Lalou, Marcelle. Répertoire du Tanjur d'après le catalogue de P. CORDIER, avec une préface de PAUL PELLIOT. VIII+243 p. Paris, Bibliothèque nationale, 1933. ISIS

Reviewed by J. FILLIOZAT, *Journal Asiatique* 229, 524, 1937 (received Nov. 1938).

Ui, Hakuju ; Suzuki, Munetada ; Kanakura, Yenshô ; Tada, Tôkan. A complete catalogue of the Tibetan Buddhist canons. (Bkaḥ-ḥgyur and Bstan-ḥgyur). XV+701 p. A catalogue-index of the Tibetan Buddhist canons. III+124 p. Sendai, Japan, Tôhoku Imperial University, 1934. ISIS

EASTERN ASIA

(Including works relative to the whole of Buddhist Asia, or to India, Central and Eastern Asia combined)

Merrill, Elmer D. ; Walker, Egbert H. A bibliography of Eastern

Asiatic botany. XLII+719 p. Jamaica Plain, Arnold Arboretum, 1938. ISIS

Reviewed by JOHN H. BARNHART, *Science* 89, 297, 1939; and by PAUL H. OEHSER, *Science* 89, 342, 1939.

Wen-jen, Liao. Tôyô kakke-byô kenkyû. (Historical study of the beri-beri in the Orient). 428 p., port. Kyoto, Kaniya, 1936. ISIS

Reviewed by SHIO SAKANISHI, *Isis* 29, 449-50, 1938.

9. — INDIA

Childe, V. Gordon. India and the West before DARIUS. *Antiquity* 13, 5-15, 4 pl., 1939. ISIS

David-Neel, Alexandra. Vom Leiden zur Erlösung. Sinn und Leh des Buddhismus. 196 p. Leipzig, BROCKHAUS, 1937 (Mk. 5). ISIS

Mrs. DAVID-NEEL's books have often been mentioned or reviewed in *Isis* (e.g., 14, 441-44). This one is a translation of her book on Buddhism originally published in French (*Le Bouddhisme*, Paris, 1936). It is based on her own experience of twenty years in various Buddhist countries, a source of knowledge which is in many ways preferable to mere book learning. In this field as in every other, book learning, however necessary, is utterly insufficient. The book is divided as follows : 1. BUDDHA; 2. Die Grundlagen der buddhistischen Lehre; 3. Das Leiden und die Aufhebung des Leidens, 4. Die " untereinander abhängigen Entstehungen "; 5. Der achtteilige Pfad; 6. Das Karman (Karma); 7. Das Nirwâna. G. S.

Dumont, P. E. L'Agnihotra. Description de l'agnihotra dans le rituel védique. D'après les Śrautasûtras de Kâtyâyana (Yajurveda blanc) ; Âpastamba, Hiraṇyakeśin, Baudhâyana, Manu (Yajurveda noir) ; Âśvalâyana, Śâṅkhâyana (Ṛgveda) ; et le Vaitâna-sûtra (Atharvaveda). XIII+225 p. Baltimore, Johns Hopkins Press, 1939 ($3.00). ISIS

" Quoique l'agnihotra soit un sacrifice relativement simple, il occupe dans le rituel védique une place de la plus grande importance. D'autres sacrifices — tels que le sacrifice de la pleine lune et de la nouvelle lune, le sacrifice sanglant, le sacrifice de soma, le sacrifice du cheval — sont plus compliqués et sont offerts avec plus de pompe. Mais ce qui fait l'importance de l'agnihotra, c'est que c'est un sacrifice quotidien et un sacrifice perpétuel. En effet, c'est un sacrifice que tout chef de famille appartenant à la classe des brahmanes ou à la classe des vaiśyas doit offrir chaque jour, soir et matin, sa vie durant. Dans le présent ouvrage, j'ai tenté de donner une description détaillée de ce sacrifice. J'ai eu d'abord l'intention de décrire l'agnihotra selon tous les Sûtras à la fois. Mais il m'a semblé ensuite qu'à cause des divergences que présentent les textes, une description faite de cette manière pourrait manquer de clarté, et c'est pourquoi j'ai décidé de décrire le sacrifice

selon chaque Sûtra séparément; et j'ai borné mon étude à l'examen de huit Sûtras..." " Le lecteur trouvera à la fin du volume, une table synoptique qui lui permettra de comparer les passages parallèles des différents Sûtras, de voir comment tel ou tel rite est décrit dans ces différents Sûtras, et de se rendre compte des conformités, des ressemblances et des divergences que présentent les différentes écoles liturgiques dans la description de tel ou tel détail du sacrifice."

Eliade, Mircea. Cosmical homology and Yoga. *Journal of the Indian Society of Oriental Art*, 1937, 188-203 (COOMARASWAMY volume). ISIS

Lalou, Marcelle. Le culte des Naga et la thérapeutique. *Journal asiatique* 230, 1-19, 1938 (received May 1939). ISIS

Laubry, Charles ; Brosse, Thérèse. Documents recueillis aux Indes sur les " Yoguis " par l'enregistrement simultané du pouls, de la respiration et de l'électrocardiogramme. *Presse médicale*, no. 83, du 14 octobre 1936. ISIS

Reviewed by J. FILLIOZAT, *Journal asiatique* 229, 521, 1937 (received Nov. 1938).

Mariadassou, Paramananda. La magie noire. 192 p., fig. Pondichéry, Imprimerie Sainte-Anne, 1938. ISIS

Reviewed by J. FILLIOZAT, *Journal asiatique* 229, 518, 1937 (received Nov. 1938).

Poleman, Horace I. ; Roche, Philip Q. Aspects of Caesarean section in India. *Journal of the American Oriental Society* 59, 17-21, 1939. ISIS

Poleman, H. I. A census of Indic manuscripts in the United States and Canada. XXIX+542 p. (American oriental series, 12). New Haven, Conn., American oriental society, 1938. ISIS

" This census of Indic manuscripts was begun in the summer of 1933. The American Council of Learned Societies financed the compilation and printing, and the Library of Congress made possible the survey of the field. No one suspected at the start of this work that more than 3000 to 4000 manuscripts would be found in American public and private libraries, but as a result of an intensive survey between 7500 and 8000 items, including the uncatalogued and special collections found in the Appendix, were discovered in a total of sixty-nine public and thirty-eight private libraries situated in Canada and in twenty-four states and the District of Columbia in the United States." " The list includes all manuscripts in Sanskrit,

Pali, Prakrit, the older and modern stages of the vernaculars, various Dravidian languages, and the languages of Greater India, including Burma, Ceylon, Siam, and Tibet." ... "For the most part only texts composed before 1800 A.D. have been included. Batak, Bugis, and Malay manuscripts were not systematically sought for, but those encountered are noted. These American manuscripts are especially rich in Jain texts, the bulk of which are found at Harvard."

Rhys Davids, C. A. F. To become or not to become (That is the question!). Episodes in the history of an Indian word. XII+164 p. London, LUZAC, 1937. ISIS

Rhys Davids, Mrs. C. A. F. What was the original gospel in Buddhism? 143 p. London, Epworth Press, 1938. ISIS

Elaborate and very instructive review by ANANDA K. COOMARASWAMY, *Journal of the American Oriental Society* 58, 679-86, 1938.

Sardesai, R. N. Picturesque orientalia, being a collection of 103 photos of the eminent Indologists—living and dead—of the West (Poona oriental series, no. 56). Poona, Oriental book agency, 1938. (Rs. 10). ISIS

The idea of collecting portraits of a number of Indologists and constituting an iconography of Homo sanskriticus was excellent, and the result is valuable in spite of the fact that it was done with an almost complete absence of care and criticism. The explanations are very insufficient and the proper names frequently misspelled. G. S.

Sastri, P. S. Subrahmanya. History of grammatical theories in Tamil and their relation to the grammatical literature in Sanskrit. XVI+250 p. (*Journal of Oriental Research*). Madras, 1934. ISIS

Reviewed by J. FILLIOZAT, *Journal asiatique* 229, 512-17, 1937 (received Nov. 1938).

Sinha, Jadunath. Indian realism. 287 p. London, KEGAN PAUL, 1938. ISIS

Téchoueyres, E. A la recherche de l'unité. Essais de philosophie scientifique et médicale. 184 p. Paris, BAILLIÈRE, 1937. ISIS

Reviewed by J. FILLIOZAT, *Journal asiatique* 229, 683-84, 1937 (received Jan. 1939.)

10. — CHINA

Boodberg, Peter A. On the use of the animal cycle among "Turco-Mongols." *Harvard Journal of Asiatic Studies* 3, 243-53, 1938. ISIS

Chao, Y. R. A preliminary study of English intonation (with American variants) and its Chinese equivalents. *Ts'ai Yüan p'ei* anniversary volume (supplementary vol. I of the *Bulletin of the Institute of history and philology of the Academia Sinica*, 103-56, Peiping, 1932. ISIS

This is a very original explanation of the Chinese four tones (*ssu shêng*) by comparison with English and American intonation. However, in Chinese intonation is an etymological part of each word, a lexical element of it, while in English there is no etymological intonation, that is, any word may be intoned in various ways without losing its lexical identity. The study is very elaborate and very suggestive. G. S.

Chatley, Herbert. " The heavenly cover "—a study in ancient Chinese astronomy. *The Observatory* 61, 10-21, 1938. ISIS

" The majority of Chinese astronomers of pre-Christian times regarded the heavens as a more or less hemispherical concave vault, raised above a somewhat similarly shaped convex but four-sided earth. ' The image of Heaven is a parasol which envelopes; that of the Earth is an overturned basin. Heaven is separated from the Earth by a distance of 80,000 *li*' (*Chou Pei Suan Ching*, pt. II). Analogous ideas were held by the Babylonians." ... " ' This hypothesis is known as *T'ien Kai* or ' The heavenly cover,' and obviously implies curvature of both the vault and the Earth's surface. It is explained in considerable detail in a book entitled *Chou Pei Suan Ching* or ' The Mathematical Classic concerning the Dial and Gnomon.' This book is regarded by the older Chinese scholars with great respect, as embodying the learning of the ancients, and is popularly attributed to the times of the DUKE OF CHOU, the regent during the infancy of the second emperor of the CHOU dynasty (tenth century B.C.). It puts the winter solstice in the equatorial division (the ecliptic was then unknown) *Ch'ien Niu*, ' The led bull ' (Beta Capricorni to Epsilon Aquarii, present longitude 303° to 310°), which would correspond to any time from 1000 B.C. to 455 B.C."

Chochod, Louis. La notion du temps et le calendrier dans l'ancienne Chine. *Mercure de France* 290, 309-23, 1939. ISIS

Collier, H. Bruce. A Sung dynasty alchemical treatise : " Outline of alchemical prescriptions " by TU-KU T'AO. Translated from the Chinese by FUNG CHIA-LOH and H. BRUCE COLLIER. Introduction and notes by H. B. COLLIER. *Journal of the West China Border Research Society* 9, 199-209, 1937. ISIS

" A translation of a portion of an alchemical text of the Sung Dynasty is given below. The authors regard this translation as of little value in itself. Terminology is a problem of great difficulty (another similarity with Western alchemy), and the translators claim no great familiarity with alchemical terms. (Ts'AO states that the terms *lung*, dragon and *hu*, tiger refer to mercury and lead respectively. However, the treatise in the *Taoist Canon* entitled the *Great Pill Record*, plainly states : ' Dragon is

mercury, tiger is silver; but silver is in the midst of lead.' This is an example of the confusion which may arise over the meaning of common terms.) Our purpose is simply to give an idea of the content of one of the more practical alchemical treatises of later date, to point out some of the difficulties involved and to stimulate interest in the problem. Further examination of the early historical and alchemical texts may throw light on the question of origins. The majority of the later, more practical texts have never been translated. A comparison of these, a study of the terminology and techniques, and examination in the light of modern chemical knowledge, should be of great interest and value."

Creel, Herrlee Glessner. Studies in early Chinese culture. First series. XXII+266 p. (American Council of Learned Societies). Baltimore, Waverly Press, 1937. ISIS

Reviewed by ROSWELL S. BRITTON, *American Historical Review* 44, 394-95, 1939.

Dubs, Homer H. The history of the former Han dynasty. By PAN KU. Volume I, First division, The imperial annals, chapters I-V. A critical translation with annotations by HOMER H. DUBS, with the collaboration of JEN T'AI and P'AN LO-CHI. XIII+339 p. (American Council of Learned Societies). Baltimore, Waverly Press, 1938. ISIS

Reviewed by DERK BODDE, *American Historical Review* 44, 641-42, 1939.

Dubs, Homer H. Solar eclipses during the former Han period. *Osiris* V, 499-522, 1938. ISIS

"The Former Han dynasty lasted from 206 B.C. to A.D. 23, a period of 230 years (if we include the reign of WANG MANG). During that time some 559 eclipses of the sun occurred, of which 98 or 17.5 % were visible in China. Fifteen of these were very small eclipses or were invisible in the capital, so that it is unfair to expect that Chinese astronomers should have noticed them. Of the remaining 83 eclipses, 55 or almost two-thirds seem to have been recorded by Chinese astronomers. A detailed treatment of these eclipses has been prepared and will appear in the appendices to my translation of the *History of the Former Han Dynasty*, so that I need merely summarize my results here in the form of a list of the visible eclipses with annotations."

Eberhard, Wolfram. Eine neue These über die Chronologie des CH'UN-CH'IU und der Chou-Zeit. *OLZ* 42, 73-76, 1939. ISIS

Feng, D. R.; Kilborn, L. G. *Nosu* and *miao* arrow poisons. *Journal of the West China Border Research Society* 9, 130-34, 1 pl., 1937. ISIS

Gardner, Charles S. Chinese traditional historiography. 120 p. Cambridge, Harvard University Press, 1938. ISIS

Reviewed in *Journal of the American Oriental Society* 59, 152-53, 1939.

Goodrich, L. Carrington. Early prohibitions of tobacco in China and Manchuria. *Journal of the American Oriental Society* 58, 648-57, 1938. ISIS

Hoh, To-Yuen. Guide to Chinese reference books. 778 p. Canton, Lingnan University Library, 1936. ISIS

Reviewed by J. K. SHRYOCK, *Journal of the American Oriental Society* 59, 156, 1939.

Hommel, Rudolf P. China at work. An illustrated record of the primitive industries of China's masses, whose life is toil, and thus an account of Chinese civilization, x+366 p., 536 fig. New York, DAY, 1937. ISIS

A very elaborate account of Chinese tools and technology with abundant and admirable illustrations (536 in number). This is the fruit of an expedition to China begun in 1921, planned, equipped and directed by HENRY CHAPMAN MERCER, founder of the Mercer Museum of Bucks County Historical Society, Doylestown, Pennsylvania. G. S.

Hughes, E. R. The invasion of China by the Western World. XVII+324 p. New York, MACMILLAN, 1938 ($3.50). ISIS

An authoritative account of the penetration of China by western ideas and culture, by the reader in Chinese religion and philosophy at Oxford. M. F. A.-M.

Ku Chieh-Kang. A study of literary persecution during the Ming. Translated by L. CARRINGTON GOODRICH. *Harvard Journal of Asiatic Studies* 3, 254-311, 1938. ISIS

Liu, Chungshee H. A tentative classification of the races of China. *Zeitschrift für Rassenkunde* 6, 130-50, 1937. ISIS

Liu, Gaines. Some extracts from the history of entomology in China. *Psyche* 46, 23-28, 1939. ISIS

Muller, James Arthur. Apostle of China : SAMUEL ISAAC JOSEPH SCHERESCHEWSKY, 1831-1906. 279 p. Milwaukee, MOREHOUSE-GORHAM, 1937. ISIS

Reviewed by K. S. LATOURETTE, *American Historical Review* 44, 450, 1939.

Sakanishi, Shio. The spirit of the brush. Being the outlook of Chinese painters on nature. From Eastern Chin to Five dynasties A.D. 317-960. 108 p. (Wisdom of the East series). New York, DUTTON, 1939. ISIS

This charming little book might be considered an introduction to the one published in 1935 by the same author in the same collection (*Isis* 25, 461-64). That book dealt with the essay on landscape painting by KUO HSI (born c. 1020), the present with the sayings of ten Chinese painters ranging from the IVth to the Xth century. These sayings reveal the gentlest and most lovable side of Chinese thought, also the most original if one considers that there was hardly anything comparable in the West almost until the time of LEONARDO DA VINCI. Though the bibliography quoted at the end is meant to give only the essential, the non-inclusion of RAPHAEL PETRUCCI's great work on the *Chieh tzu yüan hua ch'uan* (1918, *Isis* 4, 345-47) is regrettable. Says the jacket : "The early Chinese artists of the Fourth Century were also the first art-critics of painting, and the ancient philosophy of the Tao, or Way, influenced their whole aesthetic outlook. These few essays that have come down to us are of priceless value in showing the gradual evolution of great ideals, and the profound differences in method and approach between East and West. In a brief suggestive commentary the author reveals the way in which the Chinese masters were able to transcend the limitations of time and space." G. S.

Soothill, W. E. ; Hodous, L. A dictionary of Chinese Buddhist terms. 510 p. London, KEGAN PAUL,. 1937. ISIS

Reviewed in *Journal of the American Oriental Society* 58, 694-95, 1938.

Têng Ssŭ-yü. Chung-kuo k'ao-shih chih-tu shih (History of the Chinese civil service examination system). Published by the Examination *Yüan* of the National Government, Nanking, 1936 (in Chinese). ISIS

Analysis by Dr. HUMMEL in the *Report of the Librarian of Congress*, 1938, p. 221-24. G. S.

II. — JAPAN

Fujikawa, Wataru ; Kure, Shuzô. Nihon igaku rekishi shiryô mokuroku (Catalogue of the source material for the history of Japanese medicine). 54 p. (Published on the occasion of the Sixth Congress of the Far Eastern Tropical Medicine). Tokyo, 1925. ISIS

The present catalogue lists 309 items beginning with a portrait of Priest KWANROKU who came from Korea in 414 A.D. and by the order of Emperor SUIKO started a medical training-school with three students. The *Taihô* Code issued in 701 defines the function of medical officers, medical schools and ranks and degrees of the physicians as well as the regulations for the

general practitioners. Though it is commonly believed that anatomical study was introduced by the Dutch physicians, Dr. FUJIKAWA proves that TOYO YAMASAKI (1706-63) performed an autopsy in 1754 on a corpse granted him by the magistrate office and corrected various errors found and perpetuated by the Chinese and Japanese medical men. AMBROISE PARÉ (1510?-1590), CASPAR SHAMBERGEN and others whose works were translated into Japanese in the 17th and early part of the 18th centuries, important Chinese herbals which influenced Japanese study of botnay and medicine as well as the works of KÄMPHER, THUNBERG, and SIEBOLD are listed in the present catalogue. S. S.

Kawase, Kazuma. Ko katsuji han no kenkyû (Studies in the old movable type printing in Japan). 885 p., 2 front., 1 map. A supplementary volume entitled *Ko katsuji han no kenkyû* : Fuzu, contains 607 facsimile reproductions of old books together with 16 pages of explanatory text and index. Tokyo, Yasuda Library, 1937. ISIS

Reviewed by SHIO SAKANISHI, *Journal of the American Oriental Society* 59, 147-48, 1939.

Ogawa, Kensaburo. Nihon ganka-gaku shôshi. (A brief history of ophthalmology in Japan). 237 p., pl., illus. Tokyo, Toô-dô, 1904. ISIS

Reviewed by SHIO SAKANISHI, *Isis* 29, 452, 1938.

Ogura, Kinnosuke. Hôken sûgaku no metsubô (Decline of the Japanese native mathematics of the feudal period.). *Kaizo*, 20, 107-21, illus., 1938. ISIS

Reviewed by SHIO SAKANISHI, *Isis* 29, 451, 1938.

Ogura, Kinnosuke. Nihon sûgaku no tokushu-sei (Unique features of Japanese mathematics). *Chuo Koron* 53, 31-47, illus., 1938. ISIS

Reviewed by SHIO SAKANISHI, *Isis* 29, 450, 1938.

Shimoyama, Junichirô ; Ikeguchi, Keizô. Nihon yakusei chûkai (An annotated collection of acts regulating drugs and medicine). 925 p. Tokyo, Nankô-dô, 1936. 7th rev. and enl. ed. (Yen 7.00). ISIS

In the first chapter the authors trace the evolution of laws and regulations relating to pharmacy which were strictly patterned after the Chinese system. By the end of the 8th century, the court pharmacists were sent out to the provinces to gather native herbs and medicinal insects and animals. In the Middle Ages there was no outstanding improvement in this field, but

in the 17th and 18th centuries, with the introduction of Dutch medicine and chemistry, a great advance was made in pharmaceutical studies. The first pharmacy act was enacted in 1873, and since then a good many acts for the control of drugs and patent medicines have been issued.

The second chapter gives the history as well as the successive acts for regulating the qualifications of pharmaceutical chemists and the rules enforced by the Pharmaceutical Society of Japan. The Poisons and Pharmacy Act, Acts relating to Patent Medicine, Food and Drug Acts and other miscellaneous acts relating to pharmacy are carefully collected and annotated. Appended are the pharmacy acts of Korea, Formosa, Kwantung Territory, Germany, Great Britain, and the United States. The most significant section of the present work for *Isis* is the brief history in the first chapter. S. S.

Siebold, Philipp Franz von (1796-1866). Eight Mss., Dutch and Japanese, used by SIEBOLD for his great work on Japan c. 1823-29 reproduced in facsimile by the Japan-Deutsches Kultur-Institut in Tokyo c. 1938. ISIS

Reviewed by SHIO SAKANISHI in *Report of the Librarian of Congress* for 1938, p. 239-41. G. S.

Young, W. A. Notes on a bygone Japanese craft, with special reference to materials and technique. *Transactions of the Newcomen Society* 17, 1936-37, 91-107, 5 fig., 1938. ISIS

On sword fittings. G. S.

12. — ISRAEL

(Including works devoted to Palestine)

Aharoni, I. On some animals mentioned in the Bible. *Osiris* V, 461-78, 1938. ISIS

Study based upon the author's observations of the animals in Palestine as well as upon his study of the Biblical and Talmudic literature. G. S.

Ginzberg, Louis. The legends of the Jews. Bible times and characters. Vol. I : From the creation to JACOB, XVIII+424 p., 1909 ; Vol. II : From JOSEPH to the Exodus, VII+375 p., 1910 ; Vol. III : From the Exodus to the death of MOSES, X+481 p., 1911 ; Vol. IV : From JOSHUA to ESTHER, VII+448 p., 1913 ; Vol. V : Notes to volumes I and II, XI+446 p., 1925 ; Vol. VI : Notes to volumes III and IV, I+490 p., 1928 ; Vol. VII : Index, by BOAZ COHEN, IX+612 p., 1938. Philadelphia, Jewish Publication Society of America. ISIS

Reviewed by SOLOMON GANDZ, *Isis* 29, 445-49, 1938.

Greenstone, Julius H. The Holy Scriptures. *Numbers*, with commentary. XXXVIII+373 p., 2 maps. Philadelphia, Jewish Publication Society, 1939 ($2.50). ISIS

"The Jewish Publication Society takes pleasure in presenting herewith the third volume of a series of commentaries on the books of the Bible. The firts volume, the *Book of Micah* with commentary, by MAX L. MARGOLIS, was published in 1908. The second volume, the *Book of Deuteronomy* with commentary, by JOSEPH REIDER, was published in 1937." "Dr. GREENSTONE goes first to the fountains of Jewish tradition and draws liberally from the wisdom of the sages of old as well as of the comments of the medieval Jewish exegetes who have been so much closer to the source and whose understanding of the text was of necessity much more intimate and accurate. At the same time, the labors of more recent Jewish and Christian Bible students are taken fully into account and their great contributions properly utilized. Geographical names and places are identified in so far as the latest scholarship and archaeological discoveries make such identification certain. Jewish religious institutions mentioned in the book are elucidated and their development in Jewish history indicated in every instance. The author approached his task with deep reverence and with a clear vision as to the purpose which the book should serve."

Jacobs, Maurice S. Circumcision. *Annals of Medical History* 1, 68-73, 1939. ISIS

Kamil, Murad. Des JOSEF BEN GORION (JOSIPPON) Geschichte der Juden, nach den Handschriften in Berlin, London, Oxford, Paris und Strassburg hrsg. XLVIII+333 p., 12 pl. New York, AUGUSTIN, 1938. ISIS

Careful edition of the Aethiopian text with glossaries and well indexed. Reviewed by MARCEL COHEN, *Journal asiatique* 229, 650-52, 1937 (received Jan. 1939).

Magnes, Judah Leon (1877-). MAGNES anniversary book. Contributions by members of the academic staff of the Hebrew University. Edited by F. I. BAER, F. S. BODENHEIMER, J. N. EPSTEIN, M. FEKETE, A. FODOR, I. J. KLIGLER, L. A. MAYER. LXXI+464 p. (in Hebrew), pls. Jerusalem, Hebrew University Press, 1938. ISIS

This splendid Festschrift contains a large number of learned contributions dealing with almost every branche of science and every aspect of the humanities, a magnificent homage to the man who created the Hebrew University fourteen years ago and has been guiding its destinies ever since with conspicuous wisdom and moderation. If all the leaders of Jewish Palestine had been equally moderate, the present hours would not be so full of anxiety. All the articles are in Hebrew (464 p.), but they are summarized in English (71 p.). Incidentally the *Sefer Magnes* shows that

there is not a single theory of modern science which cannot be adequately expressed in Hebrew. G. S.

Wright, G. Ernest. The pottery of Palestine : from the earliest times to the end of the early Bronze Age. IX+106 p., 4 pls. (Publications of the Jerusalem School : archaeology, 1). New Haven, American Schools of Oriental Research, 1937 ($1.75). ISIS

13. — IRAN

Przyluski, J. Une cosmogonie commune à l'Iran et à l'Inde. *Journal asiatique* 229, 481-93, 1937 (received Nov. 1938). ISIS

Stein, Sir Aurel. An archaeological journey in western Iran. *Geographical Journal* 92, 313-42, 1938. ISIS

Notes on antiquities of all periods, between Shiraz and Lake Urumia. C. W. A.

14. — ISLAM

(*also Arabia*)

Bousquet, G. H. Introduction à l'étude de l'Islam indonésien. *Revue des Études islamiques*, p. 133-259, 9 pl., 1938. ISIS

Calverley, Edwin E. The fundamental structure of Islam. *Journal of the Royal Central Asian Society* 26, 280-302, 1939. ISIS

Chung, Kei Won ; Hourani, George F. Arab geographers of Korea. *Journal of the American Oriental Society* 58, 658-61, 1938. ISIS

" Arabia has long been known to the Koreans through the Chinese histories as ' Tai sik kuk ' or ' Ta-shih.' But so far as we know there is no description of that land or of the Arabian people recorded by ancient Korean scholars. On the other hand certain Arab geographers ranging in time from the ninth to the fifteenth centuries give brief accounts of Korea : these form our subject."

Djafar Abdel-Kader, L'Emir. Monnaies musulmanes et poids en verre inédits. *Mélanges syriens offerts à* M. RENÉ DUSSAUD 1, 399-419, 1 pl., 1939. ISIS

Farmer, Henry George. The structure of the Arabian and Persian lute in the Middle Ages. *Journal of the Royal Asiatic Society* 41-51, 1939. IISS

"The most popular instrument of music with both the Arabs and the Persians during what we term the Middle Ages was the lute. It was to them what the lyre and cithara were to the Greeks of old. At the same time it was not an instrument of the people. It was *the* instrument of the professional musician and all music theory was made conformable to its technique."

Holmyard, Eric John. Mediaeval Arabic pharmacology. *Proceedings of the Royal Society of Medicine, section of the history of medicine*, 29, 1-10, London, 1935-36. ISIS

In the opinion of the author Islam made distinct contributions to pharmacology by preserving the pharmacology of the Greeks, enriching it by addition from Persia and India, by their own original observations and by improving the substances used in medicine. In handing this knowledge to the Latin world they laid the foundations of European pharmacology. The paper, though brief, is a useful summary. Twenty-one important references are cited. H. R. V.

Issa bey, Ahmad. History of the hospitals in Islam. XXII+295 p., 22 ill. Printed for the Society of Islamic Culture of Damascus, 1939 (in Arabic). ISIS

This is a revised and much enlarged translation of the treatise first published in French (Cairo, 1929). See *Isis* 14, 535, and also my *Introduction* (vol. 2, 95-97). There is a preface by SA'ID AL-AFGHĀNĪ, member of the Society of Islamic culture in Damascus, explaining the importance of this book for every student of Islam. The illustrations are also more numerous than in the Cairene text but even less good. The index which I asked for in 1930 is not provided but there is a table of contents and an alphabetic list of hospitals which will be very convenient. G. S.

Jurdâq, Manṣûr. Achievements of the Arabs in mathematics and astronomy. *Al-amâlî*, vol. 1, 905-09, Beirût, March 1939 (in Arabic). ISIS

Very well written article which does credit to a new weekly journal of great literary distinction. It would have been better if exaggerations had been avoided. For example, there is no evidence known to me that Arabic writers were acquainted with decimal fractions before modern times. If Prof. JURDĀQ knows of a mediaeval Arabic text on decimal fractions, he should publish it; that would be a discovery of the first order. Again his statement that Arabic algebra was close to ours and that AL-KHWĀRIZMĪ solved quadratic equations "as we do it ourselves" is such a gross overstatement that one wonders whether the author ever read an ancient Arabic mathematical text. To begin with those texts contain no equations. Algebra was at best in the syncopated stage, very far removed from the symbolic one. Claims that the Arabs anticipated FERMAT and DESCARTES are also exaggerations which weaken the argument instead of strengthening

it. IBN AL-HAITHAM is confused with AL-KHĀZINI. In spite of all that, I much enjoyed reading Prof. JURDĀQ's eloquent article. G. S.

Kheirallah, George I. Islam and the Arabian prophet. 176 p., 10 illus. New York, Islamic Publishing Co., 1938. ISIS

This is probably the most beautiful Islamic book thus far produced in America. It is a biography of the Prophet together with a very good account of the early history and tenets of Islam. The illustrations representing various mosques are good, and those representing the prayer postures excellent. G. S.

Krachkovski, I. J. Results of Arabic studies in the USSR during the past twenty years. *Bulletin of the Academy of Sciences of the USSR, Class of Social Sciences*, 1255-79, 1937 (in Russian). ISIS

Krachkovski, I. J. Arab geographers and travelers. *Bulletin of the State Geographic Society*, No. 5, 738-65, 5 figs., facs., 1935 (in Russian). ISIS

Meyerhof, Max. Essai sur les noms portugais de drogues dérivés de l'arabe. *Petrus Nonius* 2, 1-8, 1938. ISIS

Meyerhof, Max. Die Anfänge der arabischen Ophthalmologie. *VI^e congrès international d'histoire de la médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 122-26, Anvers, 1929. ISIS

Moghadam, M. E. A note on the etymology of the word checkmate. *Journal of the American Oriental Society* 58, 662-64, 1938. ISIS

Pines, S. Les précurseurs musulmans de la théorie de l'impetus. *Archeion* 21, 298-306, 1938 (rec'd Feb. 1939). ISIS

Renaud, H. P. J. De quelques acquisitions récentes sur l'histoire de la médecine arabe au Maroc. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 114-21, Genève, 1926. ISIS

IV. — NEW WORLD AND AFRICA

(*a*) AMERICA

Bergsøe, Paul. Gilding of copper among the pre-Columbian Indians. *Nature* 141, 829, 1938. ISIS

Buck, Fritz. El calendario maya en la cultura de Tiahuanacu. XI+210 p., 101 figs., 2 pl. La Paz, Bolivia, The Author, Casilla no. 157, 1937. ISIS

Reviewed by A. POGO, *Isis* 29, 470-72, 1938.

Bushnell, David I., jr. Drawing by GEORGE GIBBS in the Far Northwest, 1849-1851. *Smithsonian miscellaneous collections*, 97, 28 p., 18 pl., Washington, D.C., 1938. ISIS

Krickeberg, Walter. Blood-letting and bloody castigation among the American Indians. *Ciba symposia* 1, 26-34, 1939. ISIS

Krickeberg, Walter. The Indian sweat bath. *Ciba symposia* 1, 19-25, 1939. ISIS

Krogman, Wilton Marion. Medical practices and diseases of the aboriginal American Indians. *Ciba symposia* 1, 11-18, 1939. ISIS

Major, Robert Carlisle. Aboriginal American medicine, north of Mexico. *Annals of Medical History* 10, 534-49, 1938. ISIS

Wissler, Clark. The American Indian. XVII+466 p. New York, Oxford University Press, 1938 ($3.75). ISIS

This is the third edition of the standard anthropological treatise on the American Indian; it has been very appreciably enlarged since the first and second editions were issued respectively in 1917 and 1922, and brought up to date in the light of the most recent researches bearing upon every possible aspect of the life and culture of the American Indian. It is an invaluable introduction to the study of the American Indian. M. F. A.-M.

Wissler, Clark. Indian cavalcade. 353 p. New York, Sheridan House, 1938 ($3.00). ISIS

This book comprises the personal recollections of Professor WISSLER of old time Indian reservations which he visited between the last years of the nineteenth century and the first five years of the present century. It is a sympathetically told story and a sad one. There are a number of interesting examples of Indian drawings and photographs of Indians in the seventies. M. F. A.-M.

(*b*) OCEANIA

Bates, Daisy. The passing of the aborigines. XVIII+258 p. London, MURRAY, 1938 (10s. 6d.). ISIS

The story of a cultivated Englishwoman who voluntarily spent her life

in the desert devoting herself to the understanding and the rendering happier of the Australian aborigines as told by herself. A very beautiful book by a woman of whom the few human beings left in the world may well be proud. M. F. A.-M.

Elkin, A. P. The Australian aborigines. XIV+262 p. Sydney (Australia), ANGUS & ROBERTSON, 1938 (8/6). ISIS

This book, by the Professor of anthropology in the University of Sydney, is a popularly and soundly written account of the Australian aborigines calculated to meet the wants of administrators, the general reader, the student and the professional anthropologist in understanding the aborigines and their cultures. The work supplies a long felt want. It is well illustrated and a bargain at the price. M. F. A.-M.

(*c*) AFRICA (*outside Egypt and Islam*)

Frazer, Sir James George. Anthologia anthropologica : the native races of Africa and Madagascar. A copious selection of passages for the study of social anthropology from the manuscript notebooks. Arranged and edited from the MSS. by ROBERT ANGUS DOWNIE. XII+578 p., 10 pl. London, LUND, HUMPHRIES, 1938. ISIS

Reviewed in *Nature* 143, 5-6, 1939.

Frobenius, Leo (1873-1938). *Ekade Ektab.* Die Felsbilder Fezzans. Ergebnisse der Diafe X (X. Deutsch-Innerafrikanische Forschungsexpedition) nach Tripolitanien und Ost-Algier mit Ergänzungen der Diafe XII aus Zentral-Algier. XXIX+74 p., 91 pl. (Veröffentlichung des Forschungsinstituts für Kulturmorphologie). Leipzig, HARRASSOWITZ, 1937. ISIS

Reviewed by A. SCHARFF, *OLZ* 42, 148-54, 1939.

Greenway, P. J. A Swahili dictionary of plant names. XVI+112 p. Dar es Salaam, Government Printer, 1937. ISIS

Reviewed in *Nature* 142, 498, 1938.

Hobley, C. W. Bantu beliefs and magic : with particular references to the Kikuyu and Kamba tribes of Kenya Colony ; together with some reflections on East Africa after the War. III+368 p., 11 pl. London, WITHERBY. 1938. ISIS

Reviewed in *Nature* 142, 594, 1938.

Worthington, E. B. Science in Africa. A review of scientific research

relating to tropical and southern Africa. XIII+746 p. 5 maps, 8 pls. London, Oxford University Press, 1938. ISIS

" This volume forms a complement to *An African survey* by Lord HAILEY. It offers the first general and comprehensive account of the scientific work which is being done in relation to tropical and southern Africa. It supplies a bird's-eye view of all the chief physical and biological sciences which have a practical bearing on that continent, describing their organization, results, and the chief problems with which each is confronted. Dr. E. B. WORTHINGTON, a Cambridge zoologist who is now director of the Freshwater Biological Association of the British Empire, has first-hand acquaintance with African research in connexion with the biology and fisheries of the Great Lakes, and accompanied Lord HAILEY, Director of the African Research Survey, on that part of his tour which covered French and British West Africa."

PART III

SYSTEMATIC CLASSIFICATION

I. — SCIENCE IN GENERAL

15. — BIBLIOGRAPHY OF SCIENCE

Junk, W. Scientiae naturalis bibliographia. Annus II : pars 1, 2. 136 p. Den Haag, JUNK, 1938, 1939. ISIS

(Science Museum, London). Hand-list of short titles of current periodicals in the Science library. Part I : alphabetical. Edited by S. C. BRADFORD. Fifth edition. 262 p. London, His Majesty's stationery office, 1938 (9s. 0d.). ISIS

" The Library of the Science Museum is one of the largest general libraries of science and technology in Great Britain, and is especially renowned for its collection of scientific and technical periodicals, domestic and foreign. To make the great resources of the Library more generally available to industrial and scientific workers a list of all the current periodicals in the Library has now been published. The titles of some 9,000 separate periodicals are recorded in alphabetical order. The publication is an invaluable instrument to librarians, abstractors and scientific workers generally; it serves as a ready guide for readers in the library, and for those numerous institutions in Great Britain to which the privilege of borrowing is freely extended."

16. — HISTORY OF SCIENCE

(Belgium). Comité belge d'histoire des sciences. *Isis* 29, 410, 1938. ISIS

Davis, Tenney L. Decorative bronzes in the George Eastman Research Laboratory of the Massachusetts Institute of Technology. *Journal of Chemical Education* 16, 3-6, 3 fig., 1939. ISIS

Delevsky, J. L'évolution des sciences et la thèse historico-matérialiste. *Le Mois* 8, 251-59, 1938. ISIS

Druce, Gerald. Czechoslovakia's contributions to science : a survey and a forecast. *Nature* 142, 942-44, 1938. ISIS

(Duhem, Pierre). Hommage à PIERRE DUHEM, le physicien, le philosophe, l'historien des sciences. Par ABEL REY, *Thalès* 3 (1936), 31-35, Paris, ALCAN, 1938. ISIS

Gumpert, Martin. Trail-blazers of science. Life stories of some half-forgotten pioneers of modern research. Translated from the German by EDWIN L. SHUMAN. x+306 p. New York, FUNK & WAGNALLS, 1936. ISIS

Reviewed by CHARLES A. KOFOID, *Isis* 29, 460-61, 1938.

Hatch, Melville H. The limitations of science. An historical survey. *The Biologist* 19, 189-203, 1938. ISIS

Hatch, Melville H. The rôle of the individual in the history of science. *The Biologist* 15, 9-26, 1933. ISIS

Hoenigswald, R. Denker der italienischen Renaissance. Gestalten und Probleme. 248 p. Basel, Verlag Haus zum Falken, 1938. ISIS

Reviewed by WALTER PAGEL, *Isis* 29, 453-57, 1938.

Lacroix, Alfred. Figures de savants. Tome I, x+325 p., 32 pl. Tome II, 357 p., 26 pl., 1932. Tome III et IV, L'Académie des sciences et l'étude de la France d'outre-mer de la fin du XVII^{e} siècle au début du XIX^{e}. XIII+220 p., 38 pl., 259 p., 59 pl. Paris, GAUTHIER-VILLARS, 1938. ISIS

Reviewed by GEORGE SARTON, *Isis* 29, 436-40, 1938.

Margerie, Emmanuel de. *Congrès des sociétés savantes à Paris.* Discours prononcé à la séance de clôture du congrès, le samedi, 22 mai 1937. 23 p. Paris, Imprimerie nationale, 1937. ISIS

This presidential lecture contains a history of scientific congresses, which

is of special value, because the author has taken part in many of them, often in the quality of a leader. He deals chiefly with the international congresses of geology, of geography, of history, and with the meetings of the *Association française pour l'avancement des sciences.* G. S.

(Marvin, Francis S.). The Unity schools, under the direction of FRANCIS S. MARVIN. *Isis* 30, 97-99, 1939. ISIS

Miller, Hugh. Philosophy of science and history of science. *Isis* 30, 52-64, 1939. ISIS

Oxford Museum of the History of Science. *Nature* 142, 43, 1938. ISIS

Pelseneer, Jean. Query 78 apropos of scientific societies named after illustrious scientists. *Isis* 29, 407-08, 1938. ISIS

Purdue University (Lafayette, Indiana). A course in the historical and social sides of technology, by S. C. GILFILLAN. *Isis* 30, 96, 1939. ISIS

(Ruska, Julius). *Osiris* V, 601 p., 9 pl., frontispiece, 60 facs., 1938, dedicated to him[1]; includes his portrait, biography by PAUL KRAUS, and bibliography. ISIS

Sarton, George. Carnegie Institution of Washington. Division of historical research. Section of the History of science. *Isis* 30, 89-94, 1939. ISIS

" Twentieth annual report for the period extending from July 1, 1937 to June 30, 1938. (Previous reports appeared in *Year Books of the Carnegie Institution*, no. 18 to 36, 1919 to 1938; the 12th and following also appeared in *Isis*, the latest in vol. 28, 87-91)."

Sarton, George. Preface to volume XXX. Ugly ducklings. *Isis* 30, 6-16, 1939. ISIS

Sarton, George. Fifty-fourth critical bibliography of the history and philosophy of science and of the history of civilization (to end of April 1938—with special reference to sections 34 to 49 inclusive). *Isis* 29, 480-601, 1938. ISIS

" This fifty-fourth bibliography contains about 820 items of which 399 deal with sections 34 to 49 inclusive. They have been kindly contributed by twelve scholars belonging to four countries."

Sarton, George. Fifty-fifth critical bibliography of the history and philosophy of science and of the history of civilization (to end of July 1938,—with special reference to sections 50 to 58). *Isis* 30, 138-218, 1939. ISIS

"This fifty-fifth bibliography contains about 560 items of which 215 deal with sections 50 to 58. They have been kindly contributed by ten scholars belonging to three different countries."

Sarton, George. Deuxième préface au volume vingt neuf. L'histoire de la science et l'organisation internationale. *Isis* 29, 11-25, 1938. ISIS

Reprint of paper first published in Brussels 1913, with new preface.

Sarton, George. The scientific basis of the history of science. *Cooperation in research.* p. 465-81. Carnegie Institution of Washington, 1938. ISIS

Sarton, George. The study of the history of science. VIII+75 p., 6 fig. Cambridge, Mass., Harvard University Press, 1936. ISIS

Reviewed by A. B., *Organon*, 2, 277, 1938 and by R. S. WOODBURY, *Annals of Science* 3, 239, 1938.

(Science Museum). Report of the advisory council for the year 1938. 48 p. London, His Majesty's Stationery Office, 1939 (1s. 6d.). ISIS

Explaining the activities of that great center of research in the history of science and describing the main acquisitions, illustrated with many plates. G. S.

Sergescu, Pierre. Les sociétés scientifiques roumaines. *Isis* 29, 412-14, 1938. ISIS

Slichter, C. S. Science in a tavern. XI+186 p. Madison, University of Wisconsin Press, 1939 ($3.00). ISIS

This charming collection of essays and diversions on science in the making takes its title from the opening two essays on "The royal philosophers" and "The club," in the first of which Dr. SLICHTER writes attractively of the Royal Society Club and some of its early "doings," and in the second of The Club founded by JOSHUA REYNOLDS in 1764. The eight additional essays which comprise this very attractive volume are entitled: "Polymaths: Technicians, specialists, and genius." "The *Principia* and the modern age." "Science and reality." "Industrialism." "Science and authority." "The new philosophy." "The self-training of a teacher." "Heaven's highway."

In the essay entitled "The new philosophy" Dr. SLICHTER says "The new philosophy must be the philosophy of the control of man's power over himself. The issue is for the youth of this and of the next generation." This, in a sense, is the theme upon which, in the course of a very busy career as a teacher, Dr. SLICHTER has from time to time written these various essays which are brought together in the present volume. They make excellent and pleasant reading. M. F. A.-M.

Stefansson, Vilhjalmur. Adventures in error. VIII+299 p. New York, MCBRIDE, 1936. ISIS

Reviewed by GEORGE SARTON, *Isis* 29, 457-59, facs., 1938.

Taylor, F(rank) Sherwood. A short history of science. 334 p., illus. London, HEINEMANN, 1939 (8s. 6d.). ISIS

An excellent survey; emphasizes the progress of freedom of thought in the development of science to the present. Treatment chronological and topical; brief general bibliography. A. R. G.

Van den Dungen, Frans. Les vertus éducatives des sciences. *Rev. de l'Université de Bruxelles*, 44, 22-44, 1938-39. ISIS

Vetter, Quido. Dawn of new science from COPERNICUS to LAPLACE. 14 p. *Déjiny lidstva* 6, 1 (no date, received April 1939; in Czech). ISIS

Very brief outline. VETTER mentions a Moravian monk PROKOP DIVIŠ (1696-1765) who discovered the lightning rod before FRANKLIN. G. S.

Walter, Emil. Unser naturwissenschaftliches Weltbild. Sein Werden vom Altertum bis zur Gegenwart. 247 p., 84 fig. Zürich, NIEHANS Verlag, 1938. (Swiss fr. 7.80). ISIS

This is a masterpiece of condensation. Within 250 p. we are given a broad outline of the history of science and an account of the Weltanschauung of many ages including our very own. It is impossible to analyze such a book. It is, I believe, a good initiation to a subject of infinite complexity; the scholar is not the best judge of its value. G. S.

Winthrop Society for the study of the history of science, Cambridge, Mass. *Isis* 30, 97, 1939. ISIS

17. — ORGANIZATION OF SCIENCE

(*Internal organization is meant, see* Isis 1, 195.
For external organization, national or international, see section 55)

Bernal, J. D. The social function of science. XVI+482 p. London, ROUTLEDGE, 1939. ISIS

Boas, Franz (and others). Manifesto on Freedom of science. 31 p. New York, P. O. Box 22, Station H, 1938. ISIS

"A manifesto signed by 1,284 American scientists including three Nobel Prize winners, summoning their colleagues to participate actively in the defense of democracy as the sole means of preserving intellectual freedom and insuring scientific progress, was released by a committee of prominent men of science. Prof. FRANZ BOAS of Columbia University, dean of American anthropologists and former president of the American Association for the Advancement of Science, acted as spokesman for the committee. He pointed out that the manifesto was based upon the resolution passed last December by the American Association for the Advancement of Science, which declared: 'Science is wholly independent of national boundaries and races and creeds and can flourish only when there is peace and intellectual freedom.' The present outrages in Germany, Professor BOAS said, 'have made it all the more necessary for American scientists to take a firm anti-Fascist stand. We are sure that the great majority of German scientists, and the German people as a whole, abhor Fascism. The thousands of teachers and scientists who have been exiled since HITLER came to power bear testimony to the incompatibility of Fascism and science.' Our manifesto, he continued, 'declares that we scientists have the moral obligation to educate the American people against all false and unscientific doctrines, such as the racial nonsense of the Nazis. The agents of Fascism in this country are becoming more and more active, and we must join with all men of good will in defending democracy today if we are to avoid the fate of our colleagues in Germany, Austria, and Italy.'"

Boutry, G. A. Contacts of science with social problems. *Nature* 142, 422-23, 1938. ISIS

Gregory, Sir Richard. Cultural contacts of science. 56 p. (Elihu Root lectures of Carnegie Institution of Washington on The influence of science and research on current thought, fifth lecture). Washington, 1938. ISIS

Parts of this lecture were printed in *Science* 89, 163-66, 1939; *Scientific Monthly*, 48, 99-108, 1939; *Nature* 143, 68-70, 1939. A portion was delivered at the meeting of the AAAS in Richmond, Va. on Dec. 27, 1938. I B. C.

Hatch, Melville H. Obstacles to research. *The Biologist* 20, 66-78, 1938. ISIS

Kast, Ludwig. JOSIAH MACY, jr. Foundation. A review by the president of activities for the six years ended December 31, 1936. With extracts from the treasurer's reports for the years 1932-1936. 137 p., 4 port. New York, Josiah Macy, jr. Foundation, 1937. ISIS

Reviewed by CHARLES A. KOFOID, *Isis* 29, 469, 1938.

Science and society. Resolution of the AAAS, Indianapolis, 1937. *Isis* 29, 414, 1938. ISIS

18. — PHILOSOPHY OF SCIENCE

Benjamin, A. Cornelius. Science and the philosophy of science. *Philosophy of Science* 5, 421-33, 1938. ISIS

Benjamin, A. Cornelius. An introduction to the philosophy of science. XVI+469 p. New York, MACMILLAN, 1937. ISIS

Reviewed by H. T. DAVIS, *Isis* 29, 464-69, 1938.

Benajmin, A. Cornelius. The logical structure of science. 344 p. Psyche monographs, 9). London, KEGAN PAUL, 1936. ISIS

Reviewed by H. T. DAVIS, *Isis* 29, 461-64, 1938.

Birkhoff, George D. Intuition, reason and faith in science. *Science* 88, 601-09, 1938; also in *Nature* 143, 60-67, 1939. ISIS

An admirable address which deserves to be read with close attention. G. S.

Bloomfield, Leonard. Linguistic aspects of science. VIII+59 p. *International Encyclopaedia of Unified Science*, vol. 1, no. 4, 1939. ISIS

Bradley, John Hodgdon. Patterns of survival. 223 p. New York, MACMILLAN, 1938 ($2.25). ISIS

This is an admirable book, but perhaps just a little too well written. While one is engaged in admiring the felicities of the author's style one's attention tends to be distracted from what it is that he is saying, and there is not a word of this book that should be missed. In a broad and humane spirit founded on a wide and well integrated knowledge of nature and of man Dr. BRADLEY discusses the meaning of life and of living. Dr. BRADLEY shows that with the possibility of self-directed evolution man holds his future in his own hands. Everything in the book serves the function of supporting this conclusion, and of assisting towards the realization of such an humanly directed evolution. It is a book highly to be recommended to all classes of readers. M. F. A.-M.

Darwin, C. G. Logic and probability in physics. *Nature* 142, 381-84, 1938. ISIS

From the presidential address to Section A (mathematical and physical sciences) of the British Association, delivered at Cambridge on August 19. I B. C.

Enriques, Federigo. La théorie de la connaissance scientifique de KANT à nos jours. 46 p. (Coll. *Actualités scientif. et industrielles*). Paris, HERMANN, 1938. ISIS

Eve, A. S. Foundations of physics. *Nature* 142, 857-59, 1938. ISIS

Lapan, Arthur. Preface to a theory of nature. *Philosophy of Science* 5, 393-409, 1938. ISIS

Malisoff, William Marias. Virtue and the scientist. *Philosophy of Science* 6, 127-36, 1939. ISIS

Malisoff, William Marias. Arranging the sciences. II. Another experiment. *Philosophy of Science* 5, 390-92, 1 fig., 1938. ISIS

Nagel, Ernest. Probability and the theory of knowledge. *Philosophy of Science* 6, 212-53, 1939. ISIS

Neurath, Otto. Encyclopaedism as a pedagogical aim : a Danish approach. *Philosophy of Science* 5, 484-92, 1938. ISIS

Stark, J. The pragmatic and the dogmatic spirit in physics. *Nature* 141, 770-72, 1938. ISIS

White, Leslie A. Science is sciencing. *Philosophy of Science* 5, 369-89, 1938. ISIS

II. — FORMAL SCIENCES (knowledge of forms)

19. — LOGIC AND THEORY OF KNOWLEDGE

Carnap, Rudolf. Foundations of logic and mathematics. *International Encyclopaedia of Unified Science*, 1, no. 3, VIII+71 p. University of Chicago Press, 1939. ISIS

Dewey, John. Logic, the theory of inquiry. IX+546 p. New York, HOLT, 1938 ($4.00). ISIS

This work is by Professor JOHN DEWEY and that fact should alone speak for its originality, lucidity, and suggestiveness. Actually the work represents the development of ideas which were originally presented more than forty years ago in *Studies in logical theory*, and that were later expanded in *Essays in experimental logic* and summarized in that extraordinarily influential book

How we think. Logic is conceived by Professor DEWEY to be the generalized account of the means by which sound beliefs on any subject are attained and tested, such an account must necessarily be based upon the operations, inclusively and exclusively, of inquiry. The discussion and exposition of the necessary processes involved in such a logic of inquiry is the subject matter of this brilliant and excellent book. M. F. A.-M.

20. — MATHEMATICS

(American Mathematical Society). The semicentennial celebration of the American Mathematical Society, September 6-9, 1938. By the secretaries. *Bulletin of the American Mathematical Society*, 46 p., pls., Jan. 1939. ISIS

Archibald, Raymond Clare. Mathematicians, and poetry and drama. *Science*, 89, 19-26, 46-50, 1939. ISIS

"In general reading for a number of years I have been interested in accumulating information concerning, firstly, those who had not only achieved something noteworthy in mathematics but had also written verses or dramas; secondly, poems about mathematicians; and thirdly, the numerous incidental citations of mathematicians in poetry by poets of more or less distinction. Such general reading has not been confined to any one language, and translations of poetical or dramatic work of mathematicians were within the scope of my search. The large amount of material collected is in more than a score of languages, from the time of PYTHAGORAS and his 'Golden verses' down to the present. It is my purpose to give you some idea of the nature of this material. I am not aware that any one else has previously discussed this general theme."

Archibald, Raymond Clare. Outline of the history of mathematics. 4th edition, revised and enlarged. 66 p. Oberlin, Ohio, Mathematical Association of America, 1939. ($.50). ISIS

A book which has reached four editions in seven years needs no recommendations. Its great success is due to the unusually large amount of information condensed in a very small space. As far as pre-Greek mathematics is concerned, much information will be found in this little book which is not available in large treatises. G. S.

Beatty, Lewis B. Query no. 80. When was logarithmic paper first used? Who introduced it? Answer by GEORGE SARTON. *Isis* 30, 95-96, 1939. ISIS

Bortolotti, Ettore. Il Primato dell'Italia nel campo della Matematica. *Atti della XXVII Riunione della Società italiana per il progresso delle scienze* (Bologna, 1938) 17, 13 p., Roma, 1939. ISIS

Cavallaro, Vincenzo G. Storia della geometria del triangolo in Italia. *Il bollettino di matematica* 34, LXI-LXVII, 1838 (end). ISIS

Courant, Richard. Mathematical education in Germany before 1933. *American Mathematical Monthly* 45, 601-07, 1938. ISIS

Jeffreys, Harold. The nature of mathematics. *Philosophy of Science* 5, 434-51, 1938. ISIS

Loria, Gino. Le rôle de la représentation géométrique des grandeurs aux différentes époques de l'histoire des mathématiques. *Revue de Métaphysique et de Morale*, p. 57-63, 1939 (Extrait d'une conférence faite au IV[e] Congrès d'histoire des sciences, Prague, 1937). ISIS

Mahnke, Dietrich. Unendliche Sphaere und Allmittelpunkt. Beiträge zur Genealogie der mathematischen Mystik. VIII+252 p. Halle, NIEMEYER, 1937. ISIS

Reviewed by W. PAGEL, *Isis* 30, 121-24, 1939.

Sarton, George. The study of the history of mathematics. VIII+113 p. Cambridge, Harvard Univ. Press, 1936. ISIS

Reviewed by L. BRUNET, *Thalès* 3 (1936), 173-74, Paris, ALCAN, 1938; and by R. S. WOODBURY, *Annals of Science* 3, 239, 1938.

Vogel, Kurt. Die Mathematik in vor- und frühgeschichtlicher Zeit. Semester-Berichte zur Pflege des Zusammenhangs von Universität und Schule, 13. Semester, 1938/39, p. 105-28. ISIS

Vogel, Kurt. Vor- und frühgeschichtliche Mathematik. *Forschungen und Fortschritte* 15, 95-97, 1939. ISIS

Wiener, Norbert. The historical background of harmonic analysis. *American Math. Soc. Semicentennial Publications*, vol. 2, (Semicentennial addresses of the Am. Math. Soc.), p. 56-68. New York, Am. Math. Soc., 1938. ISIS

A very informative and interesting study—mainly of certain aspects of the theory of FOURIER series and integrals during the nineteenth century. The history is developed from two points of view, that of pure mathematical analysis and that of mathematical physics. In tracing this relation between mathematics and physics for a particular subject one gets "in miniature a history of the larger relations between the two disciplines." Although the stress is placed on the nineteenth century, the survey extends from HUYGENS to the present. I B. C.

21. — STATISTICS

(*History and methods. Tables and generalities. For the applications, refer to the sciences to which they are applied*)

Baten, William Dowell. Recent interests in probability and mathematical statistics. *Scripta Mathematica* 5, 165-70, 1938. ISIS

Funkhouser, H. Gray. Historical development of the graphical representation of statistical data. *Osiris* 1, 269-404, 1937. ISIS

Reviewed by HELEN M. WALKER, *Scripta Mathematica* 5, 257-59, 1938.

Nagel, Ernest. Principles of the theory of probability. *International Encyclopedia of Unified Science* 1, no. 6, VII+80 p. Univ. of Chicago Press, 1939. ISIS

III. — PHYSICAL SCIENCES (knowledge of inorganic nature)

22. — MECHANICS

(*Including celestial and atomical mechanics*)

McCrea, W. H. The evolution of theories of space-time and mechanics. *Philosophy of Science* 6, 137-62, 1939. ISIS

Neville, E. H. Time and the mathematician. *Scripta Mathematica* 5, 171-75, 1938. ISIS

23. — ASTRONOMY

Dinsmoor, William Bell. Archaeology and astronomy. *Proceedings of the American Philosophical Society* 80, 95-173, 10 fig., 1939. ISIS

Hollis, H. P. The beginning of personal equation. *The Observatory* 61, 301-02, 1938. ISIS

Knopf, Otto. Die Astronomie an der Universität Jena von der Gründung der Universität im Jahre 1558 bis zur Entpflichtung des Verfassers im Jahre 1927. *Beiträge zur Geschichte der Universität Jena*, H. 7, 1937. ISIS

Norman, Daniel. The development of astronomical photography. *Osiris* V, 560-94, 9 fig. on 4 pl., 1938. ISIS

Brief but elaborate study, followed by a chronological outline 1839-1932, including cross references to the text. G. S.

Pelseneer, Jean. Instructions pour MM. les collaborateurs de la " Bibliographie générale de l'astronomie pour les années 1881 à 1898." 12 p. Nov. 1938. ISIS

Also published in English and German.

Gokmen, Fatine. L'astronomie et le calendrier chez les anciens Turcs. 44 p., 4 figs. *Deuxième congrès turc d'histoire.* Istanbul, Devlet Basimevi, 1937. ISIS

" Nous pouvons donc conclure que le calendrier qui fait l'objet de ma thèse, fut établi 18700 ans avant Jésus-Christ." (p. 27). " Je ne crois pas être autorisé à rattacher un jugement historique aux résultats que j'ai tirés de mes recherches. Cependant, je suis convaincu que ces résultats expriment la vérité suivante : Les Turcs et les Hitais se sont établis au nord de la Chine, sont les héritiers d'une science assez élevée, fondée il y a plus de 20000 ans, mais tombée en décadence il y a 20000 ans. Ils n'ont pu conserver de cet héritage qu'une petite chose : Le calendrier qui fait l'objet de notre discussion " (p. 44).

Étude très naïve, remplie de calculs imposants et d'hypothèses extravagantes. Je me bornerai à citer " un argument solide en faveur " de la thèse de l'auteur. " Les anciens Turcs avaient déterminé la durée de l'année tropique comme étant 365,2436 $\pm$ 0,0001 jours." L'auteur fait usage de nos connaissances de la variation de la durée de l'année tropique et du décroissement de l'obliquité de l'écliptique — et trouve $t = 22800 \pm 1500$ ans comme époque de détermination de la durée de l'année tropique. Le même raisonnement donnerait pour GRÉGOIRE XIII, dont le calendrier est basé sur une année tropique de 365,2425 jours, une date remontant vers 3000 avant Jésus-Christ, et pour JULES CÉSAR, dont le calendrier est basé sur une année tropique de 365,2500 jours, une date beaucoup plus imposante que 18700 avant Jésus-Christ. A. P.

24. — PHYSICS

Chase, Carl Trueblood. A history of experimental physics. 195 p., 15 pl. New York, VAN NOSTRAND, 1932. ISIS

An elementary treatise on experiment, from GALILEO to wave-mechanics. The greater portion of the book is devoted to post-FARADAY physics. There is a supplement of a chronological table of eminent physicists from THALES to HEISENBERG. I B. C.

Crommelin, C. A. Physics and the art of instrument making at Leyden in the 17th and 18th centuries. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 62-74, Anvers, 1929. ISIS

Destouches, J. L. Les récents progrès dans la notion d'espace physique. *Thalès* 3 (1936), 85-89, Paris, ALCAN, 1938. ISIS

Dingler, Hugo. Zur Entstehung der sogen. modernen theoretischen Physik. *Zeitschrift für die ges. Naturwissenschaft*, H. 9/10, 329-41, 1939. ISIS

Dugas, René. Sur le problème de la réalité en mécanique quantique. *Thalès* 3 (1936), 125-35, Paris, ALCAN, 1938. ISIS

Einstein, Albert ; Infeld, Leopold. The evolution of physics. The growth of ideas from early concepts to relativity and quanta. x+320 p. New York, SIMON and SCHUSTER, 1938. ISIS

Reviewed by V. F. LENZEN, *Isis* 30, 124-25, 1939.

Kennelly, A. E. Recent developments in electrical units. *Electrical engineering*, 3 p., Feb. 1939. ISIS

Explaining the history and development of the MKS system which will probably be adopted in 1940. "Prof. G. GIORGI of Rome conceived and published the mks system in 1901. In 1904 he presented a paper on the subject to the International Electrical Congress of St. Louis. He showed that by taking the *meter* instead of the *centimeter* as the unit of length, and the *kilogram* instead of the *gram* as the unit of mass, retaining the mean solar second as the unit of time, with an appropriate fourth fundamental unit, the centimeter-gram-second (cgs) system became converted into an absolute system including all of the practical electrical units thus far adopted, in simple one to one relationship, thereby eliminating the numerical factors 10^7, 10^8, 10^9, etc., which connect those practical units with their basic cgs units, thus simplifying the work of the electrical engineering student." G. S.

Lindsay, R. B. The future of theoretical physics. *Philosophy of Science* 5, 452-71, 1938. ISIS

Newhall, Beaumont. Photography, 1839-1937. With an introduction. 130 p., 95 pl. New York, Museum of Modern Art, 1937. ISIS

Reviewed by DANIEL NORMAN, *Isis* 30, 127-28, 1939.

Renaud, Paul. Sur le principe de symétrie. *Thalès* 3 (1936), p. 44-54, Paris, ALCAN, 1938. ISIS

Schimank, Hans. Geschichte der Elektrisiermaschine bis zum Beginn des 19. Jahrhunderts. *Zeitschr. f. technische Physik* 16, 245-54, 1935. ISIS

Weve, H. Zur Geschichte der Brille in den Niederlanden. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 127-32, 6 figs., Anvers, 1929. ISIS

Winter, Heinrich. Die Erkenntnis der magnetischen Missweisung und ihr Einfluss auf die Kartographie. *Comptes rendus du Congrès International de Géographie*, Amsterdam, 1938, t. 2, 55-80, 4 pl. ISIS

Elaborate study of the development of knowledge on magnetic declination from the first half of the thirteenth century to the end of the seventeenth century. G. S.

25. — CHEMISTRY, PHYSIO-CHEMISTRY, INDUSTRIAL CHEMISTRY

Berthelot, Marcelin (1827-1907). Introduction à l'étude de la chimie des anciens et du moyen âge (Photographic reprint of original edition of 1889). XII+330 p. Paris, Librairie des Sciences et des Arts, 1938. ISIS

Conant, James Bryant. The chemistry of organic compounds. A year's course in organic chemistry. Revised with the assistance of MAX TISHLER. X+658 p., figs. New York, MACMILLAN, 1939. ($4). ISIS

First edition 1933. Since then the senior author has become president of Harvard University! Says the Preface : "To find space for the new additions, certain sections of the first edition have been condensed and the consideration of a few subjects omitted. Since it is of the utmost importance that a beginner be introduced to this complex science by slow stages, we have not condensed the rather extensive exposition of the basic principles characteristic of the first dozen chapters of the first edition. We have continued to stress the experimental basis of the structural theory; we have sought to show the student how to use his knowledge in solving simple problems of structure and synthesis. The seventh chapter, which deals with methods of determining structure and with methods of synthesis, has been retained with a few corrections and additions because it provides an opportunity of reviewing the fundamental principles presented in the first six chapters." ... "Our use of the electron theory of valence which in the first edition centered around the chemistry of nitrogen compounds has been extended. The concept of resonance is introduced in connection with the study of the guanidinium ion. We have made repeated use of this idea in treating aromatic compounds in the later portions of the book. The approach to this difficult subject has been experimental rather than theoretical. We have made no attempt to explain wave-mechanics, but we have emphasized the non-existance of electronic isomers which correspond to the two KEKULÉ formulas for benzene derivatives and the several structures which may be written for a substituted guanidinium ion. The student's attention is

repeatedly drawn to the fact that associated with the absence of electronic isomers is increased stability of the molecule as shown by shortened inter-nuclear distances (X-ray analysis) and by the energy relationships (basic or acid strength and heats of formation)." There are a few historical indications here and there (e.g., p. 221, 303, 326). There should be more; thus could the book become more interesting to the student and its power of stimulation be increased, without increasing its bulk materially. G. S.

Eliade, Mircea. Metallurgy, magic and alchemy. *Zalmoxis, Revue des études religieuses* 1, 85-129, 1938. ISIS

Färber, Eduard. Coppernicanische Umkehrungen in der Geschichte der Chemie. *Osiris* V, 478-98, 1938. ISIS

1. KANT's coppernicanische Tat; 2. Pendel und Polarität; 3. Kraft und Stoff; 4. Prinzip und Stoff; 5. Masse und "Äther"; 6. Phlogiston und Sauerstoff; 7. Chlor und Salzsäure; 8. Die Allgegenwart der Elemente; 9. "Organische" Chemie; 10. Katalyse; 11. Der osmotische Druck; 12. Analogien und Umkehrungen. KANT's Prognose.

Färber, Eduard. A philosophy of catalysis. *Isis* 29, 398-402, 1938. ISIS

Gibbs, F. W. On "nitre" and "natron." *Annals of Science* 3, 213-16, 1938. ISIS

"Considerable misunderstanding has arisen in the history of chemistry through the changes in meaning which the words 'nitron,' 'natron' 'nitrum,' and 'nitre' have undergone. It is therefore desirable that the manner in which the modern usage of the terms came about should be elucidated."

Jouniaux, A. Les origines françaises de la chimie analytique. 62 p. (Coll. *Actualités scient. et industrielles*). Paris, HERMANN, 1938. ISIS

Livingston, Robert. Physico chemical experiments. XI+257 p. New York, MACMILLAN, 1939. ($2.25). ISIS

"This book has been prepared in the belief that the chief purpose of a laboratory course in physical chemistry is to illustrate the basic principles of the subject. Without the opportunity which such a course offers for practical experimentation and computation, the student is likely to find it difficult to correlate the abstract principles and equations of theoretical chemistry with the experimental observations upon which they are based. However, it must be recognized that this is not the sole purpose of the course. It is only in the physico chemical laboratory that the student has an opportunity to become familiar with many of the commoner types of apparatus and to achieve some competence in the simpler techniques. For this reason, the methods used in the several experiments were chosen, whenever it seemed

consistent with the primary purpose of the experiments, to demonstrate the more important of the simple techniques and apparatus. The descriptions and directions for the use of the commoner apparatus have been placed in separate sections, in the hope that the student will realize that their utility is not limited to the immediate experiment."

Metzger, Hélène. L'évolution de l'esprit scientifique en chimie de LÉMERY à LAVOISIER. *Thalès* 3 (1936), p. 107-13, Paris, ALCAN, 1938. ISIS

Mittasch, Alwin. Über katalytische Verursachung im biologischen Geschehen. 1935 "Katalyse und Determinismus." IX+203 p. 10 fig. Berlin, SPRINGER, 1938. ISIS

See essay review by EDUARD FÄRBER, *Isis* 29, 398-402, 1938.

Morgan, Sir Gilbert T.; Pratt, D. British chemical industry : its rise and development. XII+387 p., 32 pl. London, ARNOLD, 1938. ISIS

Reviewed in *Nature* 143, 6-7, 1939.

Partington, J. R.; McKie, Douglas. Historical studies on the phlogiston theory. III. Light and heat in combustion. *Annals of Science* 3, 337-71, 1 pl., 1938. ISIS

Pietsch, Erich. Bericht über den Stand der Arbeiten an der Zentralkartei für die Geschichte der Chemie in der Redaktion des Gmelin-Handbuches, *Angew. Chemie* 51, 648-49, 1938. ISIS

Reviewed by ZAUNICK, *Mitteilungen zur Geschichte der Medizin, der Naturwissenschaften und der Technik*, 38, 93-94, 1939.

Singer, Dorothea Waley. L'alchimie. *Comptes-rendus du Quatrième Congrès International d'Histoire de la Médecine*, p. 28-36, Anvers, 1927. ISIS

26. — TECHNOLOGY

(For Mining, see 32. *Geology; for Industrial Chemistry,* 25. *Chemistry. See also Arts and Crafts under* 45)

Brannon, Peter A. Romance of beginnings of some Alabama industries. (An American pilgrimage address.). 84 p. Newcomen Society, American Branch, 1939. ISIS

Brunet, Lucien. Les techniques et leur histoire : essai de bibliographie pour 1936. *Thalès* 3 (1936), p. 155-70, Paris, ALCAN, 1938. ISIS

Dickinson, H. W. A short history of the steam engine. XVI + 255 p. Cambridge University Press, 1939 ($3.50). ISIS

This is a valuable book. Mr. DICKINSON does not actually outrun the claim of his title; this is a short history of the steam engine, and the author has made no attempt to be exhaustive. In this book he considers alone the stationary steam engine together with the steam boiler; the marine engine and locomotive are briefly touched upon up to the point where they proceed to branch off to pursue their independent careers. The first part of the book deals with the development of the reciprocating or piston engine, and in the second part the steam turbine is dealt with in which the essential principle lies in the utilization of the kinetic energy of steam. While the technical aspects of the subject are treated in a manner which will both interest and please the engineer, Mr. DICKINSON has very successfully contrived to make his book both readable and clear so that the technically unequipped reader may follow the story without any difficulty.

Mr. DICKINSON shows in what manner, at what time, and to whom the essential principles of the steam occurred, and in discussing the development of that notable discovery the author passes from the simplest to the most complex engines in an integrative manner which is calculated to illustrate the principles involved, and to show how the various difficulties and shortcomings were eventually overcome and mastered.

The book is very well illustrated with diagrams and figures, and one of the most recommendable qualities of the book is the author's recognition of the fact that the steam engine did not develop in a vacuum, but that economic and social factors played a conspicuous part in its development. The author's concluding words are (and they may be ours, too) : "The community would be well employed in making better use than it has done hitherto of the gifts that the scientist and the engineers have showered upon it; till then, further gifts would be in the nature of pearls before swine."

M. F. A.-M.

Flaxman, Edward. Great feats of modern engineering. Revised ed. 287 p., 32 pl., 47 figs., maps. New York, MILL, 1938. ISIS

An account of the achievements in civil engineering in the construction throughout the world of bridges, dams, canals, aqueducts, hydro-electric plants, breakwaters, docks, tunnels, undergrond and robot railways, and above-water railroads.

C. A. K.

Hornell, James. Origins of plank-built boats. *Antiquity* 13, 35-44, 4 pl., 1939. ISIS

Kretzmann, Edwin M. J. German technological Utopias of the pre-war period. *Annals of Science* 3, 417-30, 1938. ISIS

Moore, William Davis. Development of the cast iron pressure pipe industry in the Southern states, 1800-1938. 55 p. Newcomen Society, American Branch, 1939. ISIS

Newbury, N. F. The history of the common salt industry on Merseyside. *Annals of Science* 3, 138-48, 2 fig., 1938. ISIS

Shorter, Alfred H. Paper-making in Devon and Cornwall. *Geography* 23, 164-76, 1938. ISIS

From 1684 to present. C. W. A.

Taft, Robert. Photography and the American Scene. A social history, 1839-1889. x+546 p. New York, MACMILLAN, 1938 ($10.00). ISIS

This book, by Professor TAFT of the University of Kansas, has an interesting genesis. In the words of the author :

> Over six years ago, in reading an account of the explorations of FRÉMONT, the question arose in my mind as to the first use of photography in the exploration of the West. Upon looking this matter up, I found no ready reference to which I could turn for information. I then began the accumulation of facts, which as it grew, gradually evolved into a history of American photography.

The distinguishing feature of the present work is that the author has written it in the belief that it is just as important to know " who and what were photographed, and by whom," as it is to know what particular processes were used. The result is a happy combination of the history of photography in America and the history of America in photography.

To condense a whole century into a single volume was obviously out of the question if the work was to be at all authoritative or complete. Thus, Professor TAFT has written what is largely a history of the first half-century in American photography (1839-1889), although there are many excursions into modern history as in the case of " news photos " and commercial reproduction processes (half-tones, etc.). The book is well written in a clear and lucid style, supplemented by 65 pages of careful notes and appraisals of source materials. Each of the photographic processes is carefully described, and there is a supplement on the restoration of Daguerreotypes.

The Macmillan Company has printed the book on glossy paper (small folio) so that every other page could be partially or completely devoted to reproduction of early photographs. These alone (especially the ones of LINCOLN and of the Civil War, by BRADY) make the book well worth its moderate price. What with BEAUMONT NEWHALL's recent book (*Isis*, 30, 127, 1939) and now this, the history of photography seems finally to have come into its own.

I BERNARD COHEN.

Vermilye, William M. Human understanding in industry. 17 p. New York, National City Bank, 1939. ISIS

IV. — BIOLOGICAL SCIENCES (Knowledge of organic nature)

27. — BIOLOGY (*generalities*, " *natural history* ")

Anker, Jean ; Dahl, Svend. Werdegang der Biologie. Übersetzt von L. JOHNSSON. VII+304 p., 8 pl., 21 fig. Leipzig, HIERSEMANN, 1938. ISIS

Darlington, C. D. The evolution of genetic systems. XI+149 p. Cambridge, University Press, 1939 ($2.75). ISIS

This book by the newly appointed director of the John Innes Horticultural Institution is an important and original contribution to biological science. It is a work essentially dealing with the genetics of heredity and variation as related to chromosomal structures and physico-chemical interchanges on the one hand and to the processes of natural selection and evolution on the other, in which the nexus between the physical and biological sciences is more than indicated. Throughout the book is both readable and stimulating. There is a bibliography and an index, and the text is helped out by a number of useful figures. M. F. A.-M.

Darlington, C. D. Recent advances in cytology. With a foreword by J. B. S. HALDANE. Ed. 2, XVI+671 p., 16 pl., 160 fig. Philadelphia, BLAKISTON, 1937. ISIS

Reviewed by CHARLES A. KOFOID, *Isis* 29, 472-74, 1938.

Delaunay, Paul. L'évolution philosophique et médicale du biomécanisme de DESCARTES à BOERHAAVE—de LEIBNITZ à CABANIS. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 133-35, Anvers, 1929. ISIS

Dobzhansky, Theodosius. Genetics and the origin of species. 364 p. New York, Columbia University Press, 1937. ISIS

Reviewed by CONWAY ZIRKLE, *Isis* 30, 128-31, 1939.

Henkle, Herman H. The periodical literature of biochemistry. *Bulletin of the Medical Library Association* 27, 139-47, 1938. ISIS

28. — BOTANY

(*Agronomy, Phytopathology, Palaeobotany*)

Arber, Agnes. Herbals. Their origin and evolution. A chapter in the history of botany, 1470-1670. New ed. rewritten and enlarged.

Frontispiece. XXIV+325 p., 25 pl., 131 fig. University Press, Cambridge, 1938. ISIS

Reviewed by CONWAY ZIRKLE, *Isis* 30, 131-32, 1939.

Bower, F. O. Sixty years of botany in Britain (1875-1935). Impressions of an eye-witness. IX+112 p., 14 pl. London, MACMILLAN, 1938. ISIS

Cohen, Hk. Les titres-planches de quelques anciens herbiers et pharmacopées édités en Hollande. *VIe Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 112-13, 1 pl., Anvers, 1929. ISIS

Dall, Nan L. G. Scots herbal lore. *Proceedings of the Scottish Anthropological and Folklore Society* 3, 3-21, 1938. ISIS

Eliade, Mircea. Le culte de la mandragore en Roumanie. *Zalmoxis, Revue des études religieuses* 1, 209-25, 1938. ISIS

Gager, C. Stuart. Botanic gardens of the world. Materials for a history. Second edition. *Brooklyn botanic garden record* 27, 151-406, 1938. ($2.50). ISIS

The first edition of this very useful work (1937) was reviewed in *Isis* 29, 185. The new edition contains additions with regard to both the older gardens and the newer ones. The value of the book could still be increased by the addition of an index and of a chronological summary. G. S.

Johnsson, J. W. S. Die Muskatnuss, ein kosmetisch-erotisches Amulett. Volksmedizinische Untersuchungen. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 225-32, Antwerp, 1923. ISIS

Laufer, Berthold. The American plant migration. Part I. The potato. Prepared for publication by C. MARTIN WILBUR. 132 p., frontispiece, 6 fig. Chicago, Field Museum of Natural History, anthropological series, vol. 28, no. 1, 1938. ISIS

Reviewed by L. CARRINGTON GOODRICH, *Journal of the American Oriental Society* 59, 142, 1939.

Leclerc, Henri. Histoire du pruneau. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), 421-25, Évreux, 1922. ISIS

Lehmann, Heinrich. Beiträge zur Geschichte von *Sambucus nigra*, *Juniperus communis* und *Juniperus Sabina*. (Inaugural-Dissertation, Basel). 171 p. Zofingen, 1935. ISIS

Linné, S. Potato problems. *Nature* 143, 12-16, 3 fig., 1939. ISIS

Peyre, P. Sur l'olivier. L'histoire et la légende, les chantres sur l'olivier, l'arbre, ses fruits, son huile. Usages médicaux et pharmaceutiques. Ses parasites ; la défense sanitaire des vergers. Intoxications professionnelles agricoles, soins d'urgence. 270 p. Paris, LE FRANÇOIS, 1938. ISIS

Raymond, Paul. Nos confrères les arbres guérisseurs. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 226-32, Évreux, 1922. ISIS

Reclus, Elie (1827-1904). Physionomies végétales. Portraits d'arbres, d'herbes et de fleurs ; avec un portrait, un autographe et 49 bois gravés de LOUIS MOREAU. 184 p. Paris, COSTES, 1938. ISIS

Ces portraits de plantes sont des mélanges de botanique, de folklore et de morale. ELIE RECLUS qui fut l'un des hommes les plus nobles du siècle passé les écrivit vers 1869. Ils méritaient d'être préservés quoiqu'ils paraissent à notre âge cruel et cynique fort désuets. Il est possible que des générations ultérieures, assagies et humiliées, apprendront à les comprendre. G. S.

Short, A. K. (Dad). Ancient and modern agriculture. XXII+158 p. San Antonio (Texas), NAYLOR, 1938. ISIS

This is an annotated compilation of Biblical references to agriculture and its techniques as related to social, industrial, and cultural factors in Palestine in ancient times and today. The citations are grouped about many subjects including protection of rights, tillage, rotation, vicissitudes, crops, gardens, herbs, truck crops, orchards vineyards, flowers, shrubs, weeds, domestic animals, laborers, agricultural operations, equipment, buildings, game and other wild animals. Principles of pure stock, growing legumes, labor, and markets are recognized. Social concern over titles, taxes, usury, conservation, and inhertiance are noted. C. A. K.

Tolkowsky, S. Hesperides. A history of the culture and use of citrus fruits. XX+371 p., 113 pl., 10 fig. London, BALE, Sons & CURNOW, 1938. ISIS

" In 1946 it will be three hundred years since GIOVANNI BATTISTA FERRARI, a learned Jesuit priest and botanist of Sienna, published in Rome his monumental treatise entitled *Hesperides sive De Malorum Aureorum Cultura*

et Usu Libri Quatuor (Hesperides, or Four books on the culture and use of the golden apples); in choosing the same title for his present volume, the author wished to pay a tribute to the labours of his distant predecessor, the first pioneer in the field of citricultural history. Yet, whilst the 'Hesperides' of 1646 was entirely FERRARI's own work, that of 1937 could not have been completed had it not been for the coöperation of a number of friends and correspondents."

Van Schevensteen, Dr. Les plantes dans les maladies des yeux ; étude de folklore. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 341-67, Évreux, 1922. ISIS

29. — ZOOLOGY

Allee, W. C. The social life of animals. 293 p. New York, NORTON, 1938 ($3.00). ISIS

An extremely important contribution to the development of social behaviour in animal groups. M. F. A.-M.

Allen, Glover Morrill. Bats. 368 p. Cambridge, Harvard University Press, 1939 ($4.00). ISIS

This well illustrated book contains a surprising amount of information; in fact, it might almost be entitled "All about bats", for apparently the author has overlooked no source which might contribute to our knowledge of these interesting little flying mammals. Indeed, the ground covered is so extensive and the source material so varied that many of the chapters are practically independent essays and the book is a unit only because they add up to a comprehensive treatment of a single theme.

The reader is introduced to the subject by a short digest of modern anthropological notes on bats (ch. I, Bats in Folklore). This is followed by a collection of the stray references to bats in classical literature and the somewhat more copious description of their role in medieval superstition and in witchcraft. Older notions concerning the medicinal properties of bats are next described and bats are then carefully evaluated both as pets and as food. Chapters IV to X describe the color of bats, their hiding places, hunting methods, nocturnal habits, food and methods of feeding. This last item is developed in some detail for, while most bats are insectivorous, some eat fruit and others, the vampires, live on blood. Chapters XI to XIII give an account of the anatomical peculiarities of bats, their evolutionary origin and geographical distribution. Included in the latter is a brief taxonomic description. The remainder of the book deals with the bats' social and breeding habits, their migrations and hibernation, their enemies and parasites. The final chapter, "The Caves of Yporanga," is an account of successful collecting expedition.

Dr. ALLEN obviously has enjoyed his work and his book is clearly and simply written. He makes no attempt to hide his enthusiasm for his subject and his enthusiasm is contagious. C. Z.

Décamps, Maurice. Mon voyage à Sainte-Hélène et destruction des termites dans la maison de l'empereur. 87 p., 11 fig., 1 map. Paris, DELMAS (1936). ISIS

Hesse, Richard ; Allee, W. C. ; Schmidt, Karl P. Ecological animal geography. An authorized, rewritten edition based on *Tiergeographie auf oekologischer Grundlage*. XIV+597 p., 135 fig. New York, WILEY, 1937. ISIS

Reviewed by CHARLES A. KOFOID, *Isis* 29, 474, 1938.

Müller-Graupa, Edwin. Der Hochzeitsflug der Bienenkönigin. Die Geschichte eines biologischen Problems von ARISTOTELES bis MAETERLINCK. *Archiv für Geschichte der Medizin* 31, 350-64, 1938. ISIS

Myers, J. G. Insect singers. A natural history of the cicadas. XIX+304 p., 7 pl., 116 fig. London, ROUTLEDGE, 1929. ISIS

"It is an anomaly that to the cicadas, insects which have excited man's interest from the mists of antiquity to the present day, no comprehensive work in any language has yet been devoted. It is hoped that the present volume may fill the gap to the extent of showing firstly, what is at present known about the lives of these insects, and secondly what abundant new problems they offer to the general biologist and to the psychologist as well as to the entomologist who has in the past been too prone to content himself with an inadequate description of cicadas as cabinet specimens. That cicadas have interested workers in many widely different fields will be obvious from a glance at the bibliographical appendix. Trying to produce a well-rounded natural history of these insects, of interest also to the non-specialist, ... I have endeavoured to follow a historical treatment. With this aim I have traced first the development and extent of man's interest in cicadas before science as we know it came into being; and have prefaced succeeding sections with a historical summary of our knowledge in that branch of *tettigology*."

Newman, H. H. The phylum chordata. Biology of vertebrates and their kin. A revision of *Vertebrate zoology*. XII+477 p. 235 fig. New York, MACMILLAN, 1939 ($3.60). ISIS

"... Still another type of course, which the writer has long favored, is one in which the laboratory and lecture parts of the course are essentially independent, though supplementary. The laboratory part of such a course deals with comparative anatomy, studied system by system; while the lectures cover the whole Phylum Chordata, with emphasis upon the evolutionary history of the group, the interrelations of surviving groups, general principles illustrated by the group, and significant aspects of their natural history.

The present book presents the subject-matter of the lecture part of such a course and considerable additional matter used for supplementary reading. For many years the precursor of this volume, *Vertebrate Zoology*, has been widely used for supplementary reading in comparative anatomy courses and has, according to many reports, well served this purpose."

Peattie, Donald Culross. A gathering of birds. An anthology of the best ornithological prose. Edited, with biographical sketches. Illustrated by EDWARD SHENTON. XII+379 p. New York, DODD, MEAD, 1939 ($3.00). ISIS

A very delightful book " written for every man whose heart has leaped at the bright flash of a bird's wing or the melody of a bird's song. It gathers together for the first time the best that has been said about birds by the great naturalists throughout the world in the last century and a half. Here is the great privilege of reading, in one volume, HUDSON on the English jackdaw and the golden plover of the pampas; JOHN MUIR on the ouzel; GILBERT WHITE on the swift; CHERRY KEARTON on the penguin; GUSTAV ECKSTEIN on the canary; BUFFON on the nightingale; NUTTALL on the mocking bird; WILLIAM BEEBE on the hoazin; ALFRED RUSSEL WALLACE on the birds of paradise; CHAPMAN on the flamingo; THOREAU on the loon, the gull and the thrush; AUDUBON on the trumpeter swan and the passenger pigeon; WILSON on the ivory-billed wood-pecker; Sir EDWARD GREY on the taming of birds; RICHARD JEFFERIES on birds near London; PETER KALM on the humming bird; ELIOTT COUES on the swallow; and ROBERT CUSHMAN MURPHY on the guanay, the most valuable bird in the world." The biographical sketches are tantalizing and the illustrations suggestive. My only regret is that this excellent book does not contain my favorite bird essay; that is, JULIAN HUXLEY's " Ils n'ont que de l'âme," reprinted in his *Essays of a biologist* (1923), but one cannot have everything and the anthologist cannot collect everybody's favorites. The author has already established himself in the front rank of writer-naturalists with his *Green laurels* (1936; *Isis* 27, 95) and his sensitive biography of AUDUBON: *Singing in the wilderness* (1935; *Isis* 29, 501). G. S.

Pellett, Frank Chapman. History of American beekeeping. IX+213 p., figs. Ames, Iowa, Collegiate Press, 1938. ISIS

Modest but valuable contribution to the history of apiculture. Students of the subject will be interested to know that there are two special libraries ot apiculture in the United States. The Langstroth Memorial Library in Cornell University named in honor of the Rev. L. L. LANGSTROTH (d. 1895), America's greatest beekeeper, and the Miller Memorial Library in the University of Wisconsin, named after Dr. C. C. MILLER (d. 1920), another great leader. G. S.

Ritter, William Emerson. The California woodpecker and I. VIII+340 p. University of California Press, 1938 ($3.50). ISIS

This is an unusual and charming volume in which the author sets down

his reflections on the meaning of natural processes from the standpoint of a biologist who is also a philosopher. It is an admirable book, and full of novel things, well written, well illustrated, and altogether a well book.

M. F. A.-M.

V. — SCIENCES OF THE EARTH
(implying knowledge of both organic and inorganic nature)

31. — GEOGRAPHY AND OCEANOGRAPHY

Curtis, Heber D. Navigation near the Pole. *United States Naval Institute Proceedings* 65, 9-19, 5 fig., 1939. ISIS

La Roncière, Ch. de. Histoire de la découverte de la terre. Explorateurs et conquérants. VIII+304 p., 8 pl., 586 illus. Paris (VI,) Librairie LAROUSSE, 1938. ISIS

Pina, Luiz de. Os Portugueses e o conhecimento científico da Etiópia (séculos XVI e XVII). *Anais da faculdade de ciências do Porto* 23, 12 p., Porto, 1938. ISIS

Seligmann, Général. La cartographie en Belgique. *Grande Encyclopédie de la Belgique et du Congo*, 4, 25-31, Bruxelles, 1938. ISIS

De MERCATOR à nos jours. J. P.

Versel, Roger. A l'assaut des pôles. 253 p., map. Paris, MICHEL, 1938. ISIS

Popular history of arctic and antarctic expeditions. No notes, no references, no bibliography, no index. G. S.

32. — GEOLOGY, MINERALOGY, PALAEONTOLOGY, MINING

(*For palaeobotany, palaeozoology and palaeoanthropology, see respectively* 28. *Botany*, 29. *Zoology and* 39. *Prehistory*)

Dubois, Georges. L'enseignement de la géologie à l'Université de Strasbourg avant 1870. *Revue d'Alsace* 85, 60 p., 1938. ISIS

Heck, N. H. Earthquake history of the United States. Part I— Continental United States (Exclusive of California and western Nevada) and Alaska. 85 p., map. (U. S. Department of Commerce,

Coast and geodetic survey, no. 609.). Washington, U.S. Government Printing Office, 1938. ISIS

"The year 1925, during which seismological investigation was assigned by law to the United States Coast and Geodetic Survey, was a year of considerable earthquake activity. Accordingly, the Bureau was at once overwhelmed with requests for information about the earthquake history of the country. It was found that this information was nowhere available in convenient form and that much of it was lacking. In order that proper replies might be made to inquiries and that logical development of seismological investigation might be carried out it was necessary to undertake the task of making the earthquake history of the United States available to those interested. This information is scattered through many volumes, some of which are out of print and therefore accessible only in a few large libraries, and in some cases is found only in unpublished collections. It is difficult for those consulting the accounts of earthquakes to obtain relatively uniform information about earthquakes of different periods since the treatment of individual earthquakes varies widely from the elaborate report on the California earthquake of 1906, one of the most complete ever published, to the inadequate reports of early earthquakes in which it is difficult to separate fact from fiction."

Wood, H. O.; Allen, M. W.; Heck, N. H. Earthquake history of the United States. Part II—California and western Nevada. 25 p. (U.S. Department of Commerce, Coast and geodetic survey, no. 609). Washington, U.S. Government Printing Office, 1939. ISIS

"This list of destructive and near-destructive earthquakes of California and western Nevada is intended for the use of those who have to deal in a practical way with earthquake problems. The convenient arrangement and concise description makes readily accessible the information needed by these persons, but this list must not be considered as a substitute for the catalog prepared by the Seismological Society of America which is expected to be issued in 1939."

33. — METEOROLOGY, CLIMATOLOGY, AND TERRESTRIAL PHYSICS

Botley, C. M. The air and its mysteries. xv+296 p., 16 pl. London, Bell, 1938. ISIS

Reviewed by E. L. Hawke, *Nature* 142, 375, 1938.

Tannehill, Ivan Ray. Hurricanes : their nature and history—particularly those of the West Indies and the southern coasts of the United States. x+257 p. Princeton, N. J., Princeton University Press, 1938. ISIS

Reviewed in *Nature* 142, 663, 1938.

Walter, Emil. Der Schweizerföhn. *Neujahrsblatt der Naturforschenden Gesellschaft in Zürich auf das Jahr* 1938. 140. Stück. 40 p., 39 fig. Zürich, FRETZ, 1938. ISIS

Contents : 1. Eigenschaften und Wirkungen des Föhnwindes; 2. Aus der Geschichte der Föhntheorie; 3. Föhnlagen im ersten Halbjahr 1937; 4. Der Alpentalföhn vom 9./10. November 1934; 5. Der Föhnsturm vom 20./21. Mai 1937; 6. Saharastaub über der Schweiz; 7. Nochmals Geschichte der Föhntheorie; 8. Die Föhnströmung.

VI. — ANTHROPOLOGICAL AND HISTORICAL SCIENCES
(Knowledge of man, past and present)

34. — ANATOMY

Blanchet, A. Contribution à l'histoire de l'anatomie (dissection ; vivisection). *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 233-36, Évreux, 1922. ISIS

Bouchacourt, L. Présentation du moulage de la statuette en ivoire du musée de Cluny, inscrite au catalogue sous le no. 1210, et portant comme titre : Le mystère de la génération. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 555-58, Évreux, 1922. ISIS

Anatomical model of a pregnant woman. G. S.

Dalcq, A. M. Form and causality in early development. III+197 p. Cambridge, University Press, 1939 ($3.50). ISIS

This work, by an acknowledged leader in the field, represents an extremely valuable synthesis of the most significant results obtained within recent years by a veritable Pleiad of workers on the nature and causes of the early development of the egg in a variety of animal forms. It is extremely clearly written and well illustrated with many new and important figures, and the whole work is calculated not only to clarify an extremely important field of research but also to suggest what problems may most profitably be attacked at this stage in the development of the subject. In this connexion Professor DALCQ's excellent book is likely to have a considerable influence upon the work of many of the younger embryologists. In itself the book will prove indispensable to other workers in the same field, and of the greatest interest to those occupied in neighbouring fields. There is a very useful bibliography and two indices. M. F. A.-M.

De Lint, J. G. Some unknown anatomical sheets. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 91-93, 2 fig., Antwerp, 1923. ISIS

Howell, A. Brazier. Gross anatomy. VII+403 p. New York, Appleton-Century, 1939. ISIS

This exemplary volume is an example of the brilliant manner in which a vast and complicated subject may be treated both briefly and clearly and yet do perfect justice to that subject. This Professor HOWELL has succeeded in doing for gross anatomy. The 300 hours which are available in most schools for the study of anatomy are quite inadequate, and for that reason the most must be made of them. The large and excellent text-books available to the student do not quite meet the conditions; recognizing this Professor HOWELL has endeavoured to present the essential principles and facts of gross anatomy in a readily digestible manner within the time available to most students. In this he has marvellously well succeeded, and is to be heartily congratulated on a really remarkable achievement. His book will be used with profit not alone by the medical student but also by a large class of readers whose studies lie in other fields. M. F. A.-M.

Laignel-Lavastine ; Livet. L'anatomie humaine symbolique. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922,) p. 85-90, Antwerp, 1923. ISIS

Lander, Kathleen F. The study of anatomy by women before the nineteenth century. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 125-34, Antwerp, 1923. ISIS

Menetrier, P. L'anatomiste charitable. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922,) p. 114-16, Antwerp, 1923. ISIS

Nicaise, Victor (1871-1930). Sur les origines de la dissection. *V*me *Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 268-70, Genève, 1926. ISIS

Weiss, Paul. Principles of development. XIX+601 p. New York, HOLT, 1939 ($5.00). ISIS

This book is a text in experimental embryology by an acknowledged authority. Actually the book covers a far wider field than is generally understood to fall within the province of experimental embryology, and although the author attempts to deny its comprehensive character the book is in reality a most comprehensive treatment of development in most of its material phases. It is a book which all students of the biological sciences will greatly benefit by reading and studying. There is a good bibliography and an index. M. F. A.-M.

Wolff, Gerhard. Leichen-Besichtigung und Untersuchung bis zur Carolina als Vorstufe Gerichtlicher Sektion. *Janus* 42, 225-86, 1938. ISIS

35. — PHYSICAL ANTHROPOLOGY

(Anthropometry and races of man)

Boas, Franz (editor). General anthropology. XI+718 p. Boston, HEATH, 1938 ($4.00). ISIS

Produced under the general editorship of BOAS it is not too much to say that this text-book of general anthropology supersedes every other introduction to the subject that has ever been written. With the exception of the article by LIPS on Government, which is quite unsatisfactory and mars by its presence an otherwise superb volume, each of the chapters which comprise this volume constitutes in many ways an original contribution to anthropology. It would be invidious to single out any one chapter for particular praise, and a carping critic would be able to point out that in certain respects some of the chapters are not altogether up-to-date, but even were that to be done the volume still remains the best of its kind in any language. The contributors and their contributions are as follows : F. BOAS, Preface. F. BOAS, Introduction. N. C. NELSON, Geological premises. F. BOAS, Biological premises. J. H. MCGREGOR, Human origins and early man. F. BOAS, Race. F. BOAS, Language, N. C. NELSON, Prehistoric archaeology. F. BOAS, Invention. R. H. LOWIE, Subsistence. R. BUNZEL, The economic organization of primitive peoples. G. A. REICHARD, Social life. J. E. LIPS, Government. R. BUNZEL, Art. F. BOAS, Literature, music, and dance. F. BOAS, Mythology and folklore. R. BENEDICT, Religion. F. BOAS, Methods of research. Each chapter is followed by a list of footnotes and wherever necessary a list of general references. The book is very well illustrated, admirably well printed and bound, and there is a good index. In a very definite sense this book will never be superseded. M. F. A.-M.

Coon, Carleton Stevens. The races of Europe. XVI+739 p. New York, MACMILLAN, 1939 ($7.00). ISIS

In this admirably produced volume Professor COON has brought together the greater part of the available information relating to the anthropological relationships of the peoples of Europe and their component groups, and he has interpreted this information in a manner both succinct and undistorted. College students and other students from related fields who will use this book will therefore be able to judge the evidence as presented for themselves, and perhaps arrive at conclusions in some cases not quite in agreement with those drawn from the evidence by Professor COON. This, of course, will be all to the good, and it is one of the excellent qualities of the present volume that it does permit the reader to judge, at least in part, the evidence for himself. The book is illustrated with a comprehensive appendix of photographs of living peoples, a series of most excellently drawn maps, several figures, and there is a glossary, a name and subject index, and a list of books referred to; the periodic literature which runs into some 4,000 titles is given in footnotes which accompany the text.

M. F. A.-M

Landtman, Gunnar. The origin of the inequality of the social classes. XV+444 p. University of Chicago Press, 1938 ($5.00). ISIS

This is a magnificent title and the author has put an enormous amount of labor into the making of this book, but the book on the origin of the inequality of the social classes still remains to be written. In the present work the author has unfortunately followed the methods of the evolutionary school of anthropologists with the result that while his book is almost encyclopaedic in scope it is far too mosaic in character to yield any definitive conclusions. Nonetheless, it is a very stimulating work and a challenging one, and it is to be hoped that it will call forth many critical analyses, for in social theory there is at present lacking any well-founded theory of the development of the classes in various cultures. That this book will contribute to the development of such a theory will be its chief contribution to knowledge, whenafter it may be put on the shelf by the side of Sir JAMES FRAZER's *The golden bough*. M. F. A.-M.

36. — PHYSIOLOGY (*human and comparative*)

Benedict, Ralph C. The first experiment in plant physiology. *Science* 89, 411-12, 1939. ISIS

The experiment in question is concerned with growing a plant in a weighed quantity of soil, weighing the mature plant and re-weighing the soil, thus demonstrating that the increase in weight of the plant must come either from the air or water. The priority claims of NICOLAS KREBBS (Cardinal NICOLAS DE CUSA, 1401-1464), FRANCIS BACON and J. B. VAN HELMONT are discussed. C. Z.

Cannon, Walter B. The wisdom of the body. XVIII+333 p. New York, NORTON, 1939 ($3.50). ISIS

This is the revised and enlarged edition of a work published in 1932, a work which at that time went into six printings sufficiently testifying to the ability of the writer to make a by no means simple subject clear and understandable. The book presents a fascinating analysis of the coordinated physiological processes which maintain the process of stabilization within the body and to which Professor CANNON has appropriately given the name of *homeostasis*. It is up to the present time the best exposition of the subject available in any language. M. F. A.-M.

Franklin, K. J. A short history of the international congresses of physiologists. *Annals of Science* 3, 241-335, 16 pl., 1938. ISIS

Luck, James Murray ; Hall, Victor E. (editors). Annual review of physiology. Volume I, VIII+705 p. American Physiological Society, 1939 ($5.00). ISIS

Topical reviews such as this enable a critical authority on a subject to analyze and correlate contributions in a given field both within its confines

and from contributory and related subjects. Such recurrent and intermittent analyses are especially valuable as historical sources. This new enterprise aims at such breadth of treatment of a selected list of topics, changing from year to year but aiming to include ultimately the entire field. The Current volume includes 24 topics, among other such currently important ones as *Biological effects of radiation*, by JANE HOWELL CLARK; *Physiological aspects of genetics*, by G. W. BEADLE; *Developmental physiology*, by JOSEPH NEEDHAM; *Growth*, by C. B. DAVENPORT et al.; *Electrical phenomena of the brain and spinal cord*, by HALLOWELL DAVIS; and *Endocrine glands: gonads, pituitary, and adrenals*, by HERBERT M. EVANS. Extensive bibliographies are restricted to author's name and title of journal. Full indices of authors and subjects are added. C. A. K.

Schlichting, Th. H. De leer der spiritus of levensgeesten. *Bijdragen tot de geschiedenis der geneeskunde* 19, 41-54, 1939. ISIS

History of the idea of *spiritus* or life spirit. G. S.

37. — PSYCHOLOGY (*human and comparative*)

Culpin, Millais. The history of psychology in medicine. *Proceedings of the Royal Society of Medicine*, section of the history of medicine, 29, 33-40. ISIS

Horney, Karen. New ways in psychoanalysis. 313 p. New York, NORTON, 1939 ($3.00). ISIS

This is an extremely able critique of psychoanalysis by the author of *The neurotic personality of our time* who in the present work has subjected certain of the commonly regarded fundamental concepts of psychoanalysis to a searching and very cogently argued criticism. Critiques of psychoanalysis have been surprisingly few, and the only serious work devoted to the subject up to the present time has been A. WOHLGEMUTH's *A critical examination of psycho-analysis* which was published in 1923 which was too deficient in so many respects as hardly to have any influence upon the subsequent development of psychoanalysis. With the publication of the present work I think there can be little doubt that psychoanalysis will find itself entering upon a new phase of revaluation, and that is good. Dr. HORNEY's book is likely to make the hair of the orthodox stand on end, and the hundred-percenters will probably not deign to notice it. But the moderates in the ranks of psychoanalysts will be stimulated to take as critical a view of their subject as is desirable. To this end the present work will supply them with much that is sound, stimulating, and novel. The fact that Dr. HORNEY is a psychoanalyst of long standing and much experience who has only recently been able to emancipate herself from the closed system of the Freudians lends her criticism an authority which it might otherwise have lacked. Whatever view the reader may take of her accomplishment all will, I believe, agree that in publishing this book she has performed a most valuable service in the cause of clear thinking as well as of psychoanalysis itself. M. F. A.-M.

Murray, Henry A. Explorations in personality. XIV+761 p. Oxford University Press, 1938 ($8.50). ISIS

This work, edited by Dr. HENRY A. MURRAY of the Harvard Psychological Clinic, and written by him together with the assistance of twenty-eight collaborators of various schools and persuasions, is one of the most important works of its kind to appear within recent years. It is a very genuinely original work, originally conceived and executed, and its aim is to present a theory of personality and a series of techniques by means of which it may be investigated. These things are clearly achieved and MURRAY's book is bound to have profound repercussions not alone in the field of psychology but in all those disciplines in which the element of the social personality enters. Incidentally, the present volume is an excellent example of the efficient manner in which a very long work may be made to occupy a relatively small amount of space, and yet remain pleasant to look at and readable.

M. F. A.-M.

Pollnow, H. L'évolution de la psychologie infantile à la Renaissance. *Thalès* 3 (1936), 114-20, Paris, ALCAN, 1938. ISIS

Pratt, Carroll C. The logic of modern psychology. XVI+185 p. New York, MACMILLAN, 1939 ($2.00). ISIS

If psychologists were very simple people, and needed a very simple account of some of the not-so-simple problems and difficulties which are inherent in the subject-matter with which they deal, this would be their book. It is a book which only psychologists should read. It is a charmingly written book, but it is, I fear, very very slight and very very simple. M. F. A.-M.

Rawdon-Smith, A. F. Theories of sensation. XIII+113 p. New York, MACMILLAN, 1938 ($2.75). ISIS

A review of the more important theories based on experimental investigations relating to the nature and mechanism of vision and audition.

M. F. A.-M.

Rogosin, H. Telepathy, psychical research, and modern psychology. *Philosophy of Science* 5, 472-83, 1938. ISIS

Rosett, Joshua. The mechanism of thought, imagery, and hallucination. XI+289 p. New York, Columbia University Press, 1939 ($3.00). ISIS

This is an extremely original and highly important book which will be of the greatest interest and value to a large class of readers. Professor ROSETT makes a laudable attempt to coordinate the loose ends of neuro-anatomical, psychiatric and psychological discoveries into a coherent whole, and his book which is a discussion actually of the physiological bases and mechanisms of mentation and mental states both normal and abnormal, is likely to have a great influence upon subsequent developments in this field. M. F. A.-M.

Woodworth, Robert S. Experimental psychology. XI+889 p. New York, HOLT, 1938 ($5.00). ISIS

Professor WOODWORTH in the present volume has produced a work which will probably remain the standard text-book on experimental psychology for many years. It is admirably and clearly written, well illustrated, well printed, and there is a full bibliography and an index. M. F. A.-M.

39. — PREHISTORY

Golomshtok, Eugene A. The old Stone Age in European Russia. *Transactions of the American Philosophical Society* 29, pt. II, VII+p. 191-468, 1938. ISIS

This admirable monograph brings together all the available data on the Palaeolithic period in European Russia. Some hundred and thirteen localities are reported upon and these are for the most part described and figured excellently. The discussion of Soviet archaeological and anthropological theories is of great interest. The work is well illustrated, there is an excellent bibliography and an exhaustive index, altogether an admirable work.
M. F. A.-M.

McKenzie, Dan. Surgical perforation in a mediaeval skull with reference to Neolithic holing. *Proceedings of the Royal Society of Medicine*, section of the history of medicine, 29, 11-14. ISIS

Parry, T. Wilson. The collective evidence of trephination of the human skull in Great Britain during prehistoric times. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 135-51, 6 fig., Antwerp, 1923. ISIS

Raymond, Percy E. Prehistoric life. XI+324 p. Cambridge, Harvard University Press, 1939 ($5.00). ISIS

This is a delightfully written book and one that does not follow the plan of the usual textbook dealing with the history of life upon this planet. It is the more welcome for that reason. Professor RAYMOND traces the main lines of the evolution of the various forms of life over the last six hundred million years with admirable skill. Both the student and the general reader will find this an extraordinarily pleasant book to read, and one from which they cannot fail to profit. The illustrations are quite good though we could have enjoyed more of them, and the whole book is produced in the best tradition of the press from which it emanates. M. F. A.-M.

Wright, W. B. Tools and the man. XVI+236 p. London, BELL, 1939 (12s. 6d.). ISIS

This book is the best short exposition of the European and African Stone Age which has thus far been published. Both the general reader and the student will read it with pleasure and with profit. Throughout archaeology and geology are integrated in the general exposition, which fact adds very greatly to the value of the work. The illustrations are admirably well chosen and executed. There is a glossary, a bibliography, and an index.

M. F. A.-M.

40. — ETHNOLOGY (*primitive and popular science*)

Andel, M. A. van. Folkmedical themes in myths, legends and folktales. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet 1927), p. 19-23, Anvers, 1929. ISIS

Bugiel, V. La personnification de la maladie dans le folklore polonais. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 302-05, Anvers, 1929. ISIS

Johnsson, J. W. S. Les origines de la profession médicale au Danemark. Chamans d'autrefois et d'aujourd'hui. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 318-23, Anvers, 1929. ISIS

Lowie, Robert H. The history of ethnological theory. XIII+296 p. New York, FARRAR & RINEHART, 1937. ISIS

Reviewed by M. F. ASHLEY-MONTAGU, *Isis* 29, 475-77, 1938.

Nieuwenhuis, A. W. Meinungen der primitiven Völker über das Geschlechtsleben der Menschen. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 24-31, Anvers, 1929. ISIS

Quinan, Clarence. The American medicine-man and the Asiatic Shaman : a comparison. *Annals of Medical History* 10, 508-33, 7 fig., 1938. ISIS

Ünver, A. Süheyl. Quelques exemples intéressants du folklore d'Anatolie. *Türk tib tarihi arkivi* 3, 78-80, 2 pl., 1938. ISIS

Van Schevensteen, A. F. C. Geneeskunde en folklore. *Oostvlaamsche Zanten* 13, 25-32, 1938. ISIS

Van Schevensteen, A. F. C. Contribution à l'iconographie des " Egerlander amuletten." Étude de folklore religieux. *V^e Congrès*

International d'Histoire de la Médecine (Genève, 1925), 136-47, Genève, 1926. ISIS

Van Schevensteen, A. F. C. Les remèdes d'origine humaine dans les maladies des yeux. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 194-206, Antwerp, 1923. ISIS

43. — SOCIOLOGY, JURISPRUDENCE AND POSITIVE POLITY

Alihan, Milla Aïssa. Social ecology. XIII+267 p. New York, Columbia University Press, 1938 ($2.75). ISIS

An able and timely critical analysis of the sociological approach represented by Professors ROBERT E. PARK and W. E. BURGESS whose special interests have been in the study of the spatial and temporal relations of human beings as they are affected by the various components of the environment within the community which they form, rather than in society as a whole. Dr. ALIHAN critically analyses certain of the major methodological fallacies involved in the biological analogical premises of the social ecologists, and her book is of value not only in its special application to this school of sociologists but also in a more general way as illustrating the dangers which are always involved in drawing too close a parallel between human and animal groups.
M. F. A.-M.

Beard, Charles A. American government and politics. VIII+814 p. New York, MACMILLAN, 1939 ($3.75). ISIS

This is the eighth edition of a book which is one of the best accounts of the government of a great land existing in any language. Certainly it is by far and away the best account of government and politics in The United States. It is a book which should be in the possession of every citizen of the Americas, and should be read not only by them, but by all the world. These statements are neither the result of overenthusiasm nor the effects of an overparticular patriotism, for Dr. BEARD's volume is a straightforward account of government and politics in the United States which makes no attempt at floweriness in expression, or sentiment in the statement of the facts; it is, in short, a text-book, a book of facts clearly and authoritatively set out, and it is for this reason that it may be so highly recommended, particularly in these days of searching inquiry and wild experiment in the process of government. It is my honest opinion that no household and no library and no educational institution of whatever sort can afford to be without this admirable volume.
M. F. A.-M.

Ford, James. Social deviation. XXIX+602 p. New York, MACMILLAN, 1939 ($3.50). ISIS

This is an admirable text-book in a special field of sociology, namely,

that which deals with the deviation of individuals and groups from the accepted social standards of reference. The field covered is a very large one and the author has handled the pertinent materials in a very competent manner. The one weakness in the book is the handling of the biological aspects involved in many of the problems considered, but this is a weakness which only one who has had a thorough training in biology could be expected to avoid, and since the approach of the author is declaredly sociological there can be no just cause for complaint. Nonetheless, it must be apparent to most workers in the borderlands of sociology and biology that until some individual or group of individuals with the necessary biological and sociological equipment enters the field of sociology, and our institutions recognize the desirability of founding chairs in social biology, progress in this important field will be exceedingly slow. The present volume makes no attempt to be a treatise of social biology. It is a textbook in the sociology of deviation, and as such is a most excellent volume which will be found extremely useful by a wide range of students. The volume is altogether admirably produced, and there are lengthy bibliographies, questions, problems, and indices.

M. F. A.-M.

Hall, Jerome. Readings in jurisprudence. VI+1183 p. Indianapolis, BOBBS-MERRILL, 1938. ISIS

An elaborate, wisely selected collection which amply recognizes the manifold relations of jurisprudence and the social sciences. The authors of the selections included in Part I on the philosophy of law comprise the ' intellectual register,' virtually *de fond en comble*, in this field. Part II on analytical jurisprudence includes extensive discussions of the logical and conceptual structure of law and legal methods. The final section introduces us to the rapidly developing field of sociology of law and includes a wide range of relevant social science discussions. The volume is a nicely integrated, invaluable introduction to a sphere of intellectual activity which is claiming an ever-increasing need of attention.

R. K. M.

Hooton, Ernest A. The American criminal. XVII+309 p. Crime and the man. XVII+403 p. Cambridge, Harvard University Press, 1939 ($10.00 and $3.75, respectively). ISIS

The first listed of these volumes represents the forerunner of two additional volumes which when published will constitute the most exhaustive study of criminals thus far published. The second volume listed was delivered as a course of *Lowell Lectures* and presents the author's findings and conclusions in a readily readable form. Professor HOOTON finds that in certain respects criminals differ from non-criminals in being more frequently characterised by a number of physical characters which he considers to be marks of physical inferiority. Professor HOOTON is of the opinion that these differences suggest that the criminal is an " organically inferior " being, and that " Crime is the resultant of the impact of environment upon low grade human organisms." It is possible that Professor HOOTON may be wrong in his interpretation of the meaning of the evidence, but however that may eventually turn out, Professor HOOTON has performed a very notable

service towards the clarification of the isues involved. His work is bound to have a most stimulating effect upon that branch of anthropology which is, or should be, concerned with the discovery of the relations existing between structure, conduct, and culture. M. F. A.-M.

Katz, Daniel; Schanck, R. L. Social psychology. XIV+700 p. New York, WILEY, 1938 ($3.75). ISIS

This is the first general book in the field to integrate psychological and sociological conceptual schemes. Experimental materials are linked with analyses of social interaction and institutions. As a whole, the book symbolizes the extensive advances lately secured in the study of human behavior. R. K. M.

Maxey, Chester C. Political philosophies. XIII+692 p. New York, MACMILLAN, 1938 ($4.00). ISIS

In this book the author presents an account of political theories from the earliest times to the present. He has deliberately refrained from any critical evaluations, and has attempted simply to present the views of past and present thinkers clearly and in their context. In this aim he has succeeded extremely well. Selected bibliographies accompany each chapter, and there is a good index. M. F. A.-M.

Merton, Robert K. Social structure and anomie. *American Sociological Review* 3, 672-82, 1938. ISIS

Pearl, Raymond. The natural history of population. XII+416 p. New York, Oxford University Press, 1939 ($3.50). ISIS

This book represents one of the most original and important contributions to the study of the mechanics of population processes which have appeared within recent years. It will no doubt establish itself as an authority, and should be in the hands of every social scientist. M. F. A.-M.

Sait, Una Bernard. New horizons for the family. XIII+772 p. New York, MACMILLAN, 1938 ($4.00). ISIS

Without a doubt the best all-round treatise on the family from the socio-biological standpoint that has yet appeared. M. F. A.-M.

Shapiro, H. L. Migration and environment. XI+594 p. New York, Oxford University Press, 1939 ($7.50). ISIS

This important work represents a research initiated in the endeavour to discover what, if any, bodily changes occur in the descendants of immigrants who have exchanged one environment for another. The subjects of this study are all of Japanese origin, and the environments concerned are Japan and Hawaii. The results of the present careful investigation unequivocally

support the earlier findings of BOAS on *Changes in bodily form of descendants of immigrants* (Washington, 1911, and New York, 1912) to the effect that significant changes in bodily form occur in the descendants of immigrants. In the present work Dr. SHAPIRO has investigated not only the immigrants and their children, but also the original stocks from which they sprang. The anthropometric work was carried out by a single investigator, Dr. FREDERICK S. HULSE, so that the personal equation involved in the making of the measurements remains consistent. The statistical analysis is by Dr. SHAPIRO, as is also the interpretation of the results. The bearing of these upon problems of human evolution is briefly discussed by the author in this fundamental and fully documented work. M. F. A.-M.

44. — HISTORY OF CIVILIZATION

(General history, historical methods, biography and chronology)

Biographie nationale publiée par l'Académie royale de Belgique. Tome 27, 498 p. Bruxelles, 1938. ISIS

Avec ce tome vingt-septième (Waasberghe-Zypaeus) s'achève la publication (première série) de la *Biographie Nationale*, qui avait commencé à paraître en 1866. Ce tome contient de nombreuses notices consacrées à des savants et à des médecins, parmi lesquels nous mentionnerons notamment : WARLOMONT, WAUTERS (A.-J.), WAUTERS (P.-E.), WEMAER, WENDELIN, WESMAEL, WETTER, WEZ, WILLEMS, WILLIÈME, WILMART, WITTMANN, WYTFLIET, YSEUX.

Harrison, Margaret Willgoose. List of doctoral dissertations in history now in progress at American universities, December 1938. 66 p. Division of Historical Research, Carnegie Institution of Washington, 1939. ISIS

International bibliography of historical sciences. Eleventh year, 1936. Edited for the International Committee of Historical Sciences, Zurich. XXIX+449 p. New York, WILSON, 1938. ISIS

Riggs, Arthur S. The romance of human progress. 405 p., 72 pls. New York, BOBBS-MERRILL, 1938 ($5.00). ISIS

This work by the former editor of the journal *Art and Archeology* presents an archeological account of human progress, not by countries or expeditions, but by major fields of cultural progress defined in terms of human needs, desires, and social movements. These subjects are : food; housing; vanities; fear and religion; the family; social customs; sport, toys, and diversions; medical arts and surgery; burial customs and mummification; industry, commerce, and trade; inventions and discoveries in ceramics, glass, alchemy, the crafts, accounting, sanitation, and artificial incubation of poultry; arms and military organization; codification of laws and court procedures; and

writing, epigraphy, and literature. The closing chapter cites a series of dramatic archeological discoveries which reveal the unity of human passions and desires in all ages and some startling instances of ancient anticipations of modern life, ranging from a fugitive slave incident in the courts of NEBUCHADNEZZAR to a finely made set of false teeth in the jaws of a Phoenician woman at Sidon. The book is a prolegomenon to, rather than a summary or outline of, the vast extent of information which the spade has brought to light of the long procession of mankind. It displays those objects which record the slow advance of human culture but makes no pretense to be historical in either motive or method but rather to be an objective account of the gradual evolution of human cultural achievements in the many fields of man's activity. A. C. K.

Swain, James Edgar. A history of world civilization. XIX+615 p. New York, McGRAW-HILL, 1938. ISIS

In six hundred and fifteen pages (including the index) the author actually does tell the story of world civilization; naturally, it is only a sketch that Dr. SWAIN is able to give, but this he gives and gives well. The book is intended for the general reader and not for the specialist; as a member of both classes I found the book thoroughly satisfactory, easy to read, fair and honest, and for the most part reliable. The lover of footnotes will find this footnote, or the series of footnotes that this book really is to a history of world civilization, pleasant and informative reading, and the general reader will do likewise. M. F. A.-M.

45. — HISTORY OF ART

(Art and science, Iconography, Arts and crafts)

Harding, Rosamond E. M. Origins of musical time and expression. X+115 p. Oxford University Press, 1938 ($4.25). ISIS

This volume comprised of four separate papers represents an outstanding contribution to musical scholarship. It is most delightfully written and as delightfully printed and produced by the Oxford University Press. The four papers contained in this volume are respectively entitled : The metronome and its precursors; Studies in the imitation of musical instruments by other instruments and by voices; The pitch-pipe in England; On the origin and history of the forte and piano; the crescendo and diminuendo. The book is excellently illustrated and there are two good indices. M. F. A.-M.

Leichtentritt, Hugo. Music history and ideas. XV+292 p. Cambridge, Harvard University Press, 1938. ISIS

An interesting kind of elementary primer in which the author attempts to show " how closely art is connected with the actual happenings of political history, and with the world of the spirit." Although the author, a Harvard professor, is reckoned one of our leading musicologists, he here makes a

serious omission (a trait of many Germans) of any mention of the English school of the sixteenth century. There is not, for example, even mention of the name of BYRD, the great English contemporary of PALESTRINA.

I B. C.

46. — HISTORY OF LANGUAGE. WRITING AND LITERATURE

Elliott, G. R. Humanism and imagination. IX+253 p. Chapel Hill, University of North Carolina Press, 1938 ($2.50). ISIS

A series of ten essays by a disciple of MORE and BABBITT devoted to the thesis that humanism in the arts devoid of the poetic imagination becomes arid and tends to be self-defeating. A most interesting volume. M. F. A.-M.

Champion, Selwyn Gurney. Racial proverbs. CXXIX+767 p. New York, MACMILLAN, 1938 ($10.00). ISIS

The compiler of this treasury of the world's proverbs has been at his task for twenty-seven years, and in this work he has given us the largest collection of proverbs to be found in the English language. His collaborators representing the various European and Asiatic tongues have written interesting introductions to the proverbs of their own people, and the compiler and editor has written a most interesting general introduction to the whole. In looking through the various pages one is struck by a number of proverbs which one had always associated with certain great men. To quote but one, "The heart has its reasons that reason wots not of." This is French, but I had always thought that this was one of PASCAL's original mots. No doubt PASCAL picked it up as a proverb and simply incorporated it into his thought and writing. There is a very extensive and original index which should prove of great value to the proverb-hunter in a hurry. M. F. A.-M.

Jensen, Hans. Die Schrift in Vergangenheit und Gegenwart. VIII+418 p., 445 figs. Glückstadt, AUGUSTIN (1935). ISIS

Reviewed by WILLY HARTNER, *Isis* 30,132-37, 1939.

Partridge, Eric. A dictionary of slang and unconventional English from the fifteenth century to the present day. XVIII+1051 p. New York, MACMILLAN, 1938 ($12.50). ISIS

The second edition of this indispensable work containing a supplement of some fifty additional pages devoted to many terms overlooked in the first edition. M. F. A.-M.

48. — HISTORY OF PHILOSOPHY

(*See also above* 18. *Philosophy of science*)

Holmes, Roger W. The idealism of GIOVANNI GENTILE. 264 p. New York, MACMILLAN, 1937. ISIS

See essay review by GEORGE DE SANTILLANA, *Isis* 29, 366-76, 1938.

Nicholson, J. A. An introductory course in philosophy. XIII+508 p. New York, MACMILLAN, 1939 ($2.75). ISIS

What a good book this is! And how lucky is the student who makes his acquaintance with philosophy through this introduction. The book really represents an elementary historical introduction to philosophy, treating only of the essential doctrines essential to an understanding of the development of the various aspects of philosophy, philosophy being understood as an activity in which to participate rather than as a system of ideas to be contemplated or memorized. Each chapter is followed by a series of excellent exercises and instructions to read in the second half of the book which contains very satisfactory selections from the works of the great philosophers. There are name and subject indices. M. F. A.-M.

Santillana, George de. The idealism of GIOVANNI GENTILE. *Isis* 29, 366-76, 1938. ISIS

Stern, Alfred. La philosophie des valeurs. *Thalès* 3 (1936), 136-40, Paris, ALCAN, 1938. ISIS

Taube, Mortimer. A re-examination of some arguments for realism. *Philosophy of Science* 5, 410-20, 1938. ISIS

49. — HISTORY OF RELIGION (*Science and religion*)

Bevan, Edwyn. Symbolism and belief. 391 p. New York, MACMILLAN, 1938 ($5.00). ISIS

The *Gifford Lectures* for 1933-1934, being an inquiry into the relation of religious symbols to reality. M. F. A.-M.

Caires, Alvaro de. Le feu Saint Antoine et l'ordre des Antonins au Portugal. *Bulletin de la Société Française d'Histoire de la Médecine* 32, 101-12, 1938. ISIS

Eliade, Mircea (editor). *Zalmoxis, revue des études religieuses*, 1, 256 p., 1938. Paris, GEUTHNER. ISIS

Gregory, Sir Richard. Religion in science. *Scientific Monthly* 48, 99-108, 1939. ISIS

Similar to remarks made by Professor EDWIN GRANT CONKLIN in his presidential address before the American Association for the Advancement of Science at Indianapolis in 1937. Points out the significance of faith in carrying forward work and discusses the relation of science to social ethics. "The view that the sole function of science is the discovery and study of natural facts and principles without regard to the social implications of

the knowledge gained can no onger be maintained. It is being widely realized that science cannot be divorced from ethics or rightly absolve itself from the human responsibilities in the application of its discoveries to destructive purposes in war or economic disturbances in times of peace. Men of science can no longer stand aside from the social and political questions involved in the structure which has been built up from the materials provided by them and which their discoveries may be used to destroy. It is their duty to assist in the establishment of a rational and harmonious social order out of the welter of human conflict into which the world has been thrown through the release of uncontrolled sources of industrial production and of lethal weapons. By combining exalted spiritual ideals with results of research in the fields of natural knowledge, it is possible now to hope and to expect scientific guidance not only towards individual fitness but also towards a higher human perfection and a condition of social life which will make the world truly a celestial dwelling-place." C. D. L.

Van Der Leeuw, G. Religion in essence and manifestation. 709 p. New York, MACMILLAN, 1938 ($6.75). ISIS

An excellent translation of an excellent book, which appeared at Tübingen in 1933 as "Phänomenologie der Religion." A work indispensable to every student of religion and religious phenomena. M. F. A.-M.

VII. — MEDICINE

50. — HISTORY, ORGANIZATION, AND PHILOSOPHY OF MEDICINE

Alcalde, Alfonso Fernandez de. Brèves considérations sur une collection d'anciens sceaux académiques espagnols. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 314-20, 1 pl., Évreux, 1922. ISIS

Bugiel, V. L'état actuel des études d'histoire de la médecine en Pologne. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 522-25, Évreux, 1922. ISIS

Cabanès, Dr. Les étapes de la psycho-pathologie historique. Les précurseurs. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 538-43, Évreux, 1922. ISIS

Callomon, Fritz. Aus der Autographenmappe eines Arztes. Unbekannte und unveröffentlichte Briefe und Dokumente berühmter Ärzte und Naturforscher, erläutert und besprochen. *Janus* 42, 165-84, 2 facs., 1938. ISIS

Castiglioni, A. Les étudiants en médecine flamands à l'Université de Padoue. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 313-17, Anvers, 1929. ISIS

Delaunay, Paul. Les guérisseurs ambulants dans le Maine sous l'ancien régime. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 211-25, Évreux, 1922. ISIS

Diepgen, Paul. Das physikalische Denken in der Geschichte der Medizin. 39 p. Stuttgart, ENKE, 1939 (RM. 2). ISIS

"Die ungeheure Umwälzung, welche die modernen Vorstellungen von der Konstitution der Materie und dem Wesen der Energie im Denken der Naturforscher und Ärzte bewirkt haben, regt den Historiker dazu an, der Frage nachzugehen, welchen Einfluss das physikalische Denken auf die Ärztegenerationen der Vergangenheit ausgeübt hat. Bei der geschichtlichen Betrachtung dieses Einflusses ergeben sich überraschende Analogien mit der Denkweise der Gegenwart, auch wenn man nicht vergisst, dass man mit historischen Vergleichen vorsichtig sein muss."

Gay, Frederick P. Medical logic. *Bulletin of the History of Medicine* 7, 6-27, Baltimore, 1939. ISIS

Hurd-Mead, Kate Campbell. A history of women in medicine from the earliest times to the beginning of the nineteenth century. XVI+569 p., 38 pl., 23 fig. Haddam, Conn., Haddam Press, 1938. ISIS

Reviewed by JOHN B. DE C. M. SAUNDERS, *Isis* 29, 477-79, 1938.

Jayle, F. Les erreurs de paternité dans les dénominations médicales. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 366-69, Anvers, 1929. ISIS

Jorge, Ricardo. Relations médicales et scientifiques entre l'Angleterre et le Portugal. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 82-84, Antwerp, 1923. ISIS

Korns, Horace Marshall. A brief history of physical diagnosis. *Annals of Medical History* 1, 50-67, 1939. ISIS

Laignel-Lavastine ; Vinchon, Jean. Trois historiens français de la psychiatrie : CALMEIL, MOREL, ULYSSE TRÉLAT. *Comptes-rendus*

du Quatrième Congrès International d'Histoire de la Médecine, p. 92-95, Anvers, 1927. ISIS

Lindsay, Lilian. Notes on the history of dentistry in England up to the beginning of the nineteenth century. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 153-59, Genève, 1926. ISIS

(**Medicine, history. Congress XI,** 1938). Yugoslavia and the XIth international congress of the history of medicine. By HENRY E. SIGERIST. *Bulletin of the History of Medicine* 7, 99-147, 26 fig., Baltimore, 1939. ISIS

(**Medicine, history. Congress XI,** 1938). Notes sur le XI^e congrès international d'histoire de la médecine, by Dr. LAIGNEL-LAVASTINE. *Bulletin de la Société française d'Histoire de la Médecine* 32, 202-08, 1938. ISIS

Pazzini, Adalberto. La storia della medicina in Italia nell' ultimo cinquantennio (continuazione e fine dai n. 9-10 del 1937 et 3-4, 9-10 e 11-12, 1938). *Rivista di storia delle scienze* 29, 79-84, 274-83, 1938; 30, 26-38, 1939. ISIS

Pina, Luiz de. Aspectos da vida médica portuguesa nos séculos XVII e XVIII. Conferência dita na faculdade de medicina de Pôrto, em 11 de Fevereiro de 1937. 35 p. Lisboa, Casa Holandesa, 1938. ISIS

Robinson, Victor. The teaching of medical history in America. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 274-75, Anvers, 1929. ISIS

Shryock, Richard H. Freedom and interference in medicine. *Annals of the American Academy of Political and Social Science*, 28 p., Nov. 1938. ISIS

Smith, Sir Frederick. The origin of the veterinary art in England. *V^e Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 188-91, Genève, 1926. ISIS

Smith, Sir Frederick. The position of veterinary anatomy in England during the 16th, 17th and 18th centuries. *Proceedings of the Third*

International Congress of the History of Medicine (London, July 17th to 22nd, 1922), p. 288-94, 7 fig., Antwerp, 1923. ISIS

Tushnet, Leonard. Murder by disease. *Annals of Medical History* 1, 121-27, 1939. ISIS

Esso, I. Van. De geneeskundige betrekkingen tusschen Holland en Rusland in de 16e, 17e en 18e eeuw. *Nederl. Tijdschrift voor geneeskunde*, 34 p., 1938. ISIS

Van Esso, I. Vreemde artsen in russischen Staatsdienst, in Holland gestudeerd hebbende. *Bijdragen tot de geschiedenis der geneeskunde* 18, 281-91, 1938. ISIS

Viets, Henry R. The bibliography of medicine. 15 p. Menasha, Wisc., BANTA, 1938. ISIS

Read at a symposium on Medical Literature at the fortieth annual meeting of the Medical Library Association, Boston, June 29, 1938. Interesting paper well documented and well illustrated. G. S.

Villaret, Maurice ; Moutier, François. Les origines de l'injection thérapeutique intra-veineuse. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 201-10, Évreux, 1922. ISIS

Wachsmuth, Bruno. Der Arzt in der Dichtung unserer Zeit. 256 p. Stuttgart, ENKE, 1939. ISIS

51. — EPIDEMIOLOGY, HISTORY OF SPECIAL DISEASES. PUBLIC HEALTH AND SOCIAL MEDICINE

Ariëns Kappers, C. U. L'histoire de la thérapie des maladies nerveuses et mentales et son état actuel. *VI^e Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 7-18, Anvers, 1929. ISIS

Bertrand, Léon. Contribution à l'étude de la peste dans les Flandres du XIV^e au XVII^e siècle. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 42-53, Évreux, 1922. ISIS

Buer, M. C. The decrease of epidemic disease in England, 1750-1830. *Proceedings of the Third International Congres of the History of Medicine* (London, July 17th to 22nd, 1922), p. 73-75, Antwerp, 1923. ISIS

Courbon, Paul. La psychiatrie en Alsace à travers les âges. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 497-510, Évreux, 1922. ISIS

Delaunay, Paul. La lutte contre les épidémies et les maladies contagieuses dans le Maine sous l'ancien régime. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 565-67, Évreux, 1922. ISIS

Evans, George H. Plague epidemics in San Francisco : historical notes. *California and Western Medicine* 49, 383-84, 458-60, 1938 ; 50, 24-25, 1939. ISIS

Survey of the plague epidemics in San Francisco. Gives the important details about the controversy over the existence of plague in San Francisco in 1900 when certain misguided business interests denied its existence. Discusses subsequent epidemics and factors involved in control. C. D. L.

Flaxman, Nathan. History of aortic insufficiency. *Bulletin of the History of Medicine* 7, 192-209, 1939. ISIS

Haddow, Alexander. Historical notes on cancer from the Mss. of LOUIS WESTENRA SAMBON. *Proceedings of the Royal Society of Medicine*, section of the history of medicine, 29, 19-32. ISIS

Evidence is given (with illustrations) of osseous tumors from the Mesozoic period and from Egyptian, Greek and Roman, and Peruvian sources, showing the wide distribution of cancer in both man and animals in remote antiquity. A second section of the paper deals with the etymology of the term " Crab " *(karkinos)* as applied to malignant tumors. SAMBON suggests the explanation in the frequent parasitic association between crabs and the tumor-like *Sacculina*, an alternative to the usual contention that the name indicated the " grasping " nature of the tumor, similar to the action of the crab. Examples of the crab in Greek numismatics are also given, as described by SAMBON. A third section reports SAMBON's notes on the treatment of cancer by operation, metals and drugs. Dr. HADDOW has rendered a valuable service in putting some of SAMBON's notes into print. H. R. V.

Jeanselme, Édouard. Inondations, famines et tremblements de terre sont les avant-coureurs de la peste. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 37-41, Antwerp, 1923. ISIS

Katsainos, George M. Syphilis and its accomplices in mischief : society, the state and the physician. 676 p. Athens, Greece, privately printed, 1939 ($5.00). ISIS

Elaborate treatise dealing mainly with pathology and therapeutics, but with a long preface and introduction (150 p.) discussing the sociological aspects of the subject. G. S.

Messerli, M. Trois ordonnances des XV^e^ et XVI^e^ siècles relatives à l'hygiène de la ville de Lausanne. *V^e^ Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 60-62, Genève, 1926. ISIS

Morisset, Dr. L'assistance aux lépreux dans le Maine. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 431-35, Évreux, 1922. ISIS

Moulé, Léon. *Μάλις* et malleus. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 295-303, Antwerp, 1923. ISIS

Neveu, Raymond. La peste en Toscane au XIV^e^ et au XV^e^ siècle. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 61-65, Antwerp, 1923. ISIS

Regnault, Félix. Le rôle du pou dans l'histoire. *VI^e^ Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 370-71, Anvers, 1929. ISIS

Simpson, Sir W. J. R. Preventive aspects of endemics in modern times. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 45-49, Antwerp, 1923. ISIS

Thompson, C. J. S. Hygiene and public health in the early civilizations. *V^e^ Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 81-92, Genève, 1926. ISIS

Torkomian, Vahram H. Une page arménienne de l'histoire de l'inoculation variolique. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 106-08, Antwerp, 1923. ISIS

Torkomian, Vahram H. Pages inédites de l'histoire de l'ostéoplastie et du choléra. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 491-96, Évreux, 1922. ISIS

52. — HISTORY OF HOSPITALS, OF MEDICAL TEACHING AND OF THE MEDICAL PROFESSION. BALNEOLOGY, MEDICAL GEOGRAPHY

Bugiel, Vladimir. Les étudiants polonais à la faculté de médecine de Paris, aux XIV^e^ et XV^e^ siècles. *V^e^ Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 243-56, Genève, 1926. ISIS

Delmas, Paul. Diplômes de l'ancienne université de médecine de Montpellier. *V^e^ Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 222-33, 2 pl., Genève, 1926. ISIS

Dorveaux, Paul. Les chirurgiens de Metz. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine*, (Paris, 1921) p. 436-51, Évreux, 1922. ISIS

Hellinga, G. Regeling van de geneeskundige verzorging in het Amsterdamsche St. Pietersgasthuis. *Bijdragen tot de geschiedenis der geneeskunde* 19, 19-27, 1939. ISIS

Jones, Harold Wellington. The faculty of medicine of Paris. A historical study of its origin and its influence through six centuries to the outbreak of the French Revolution. *Annals of Medical History* 1, 1-29, 5 fig., 1939. ISIS

Mallat, A. L'inspectorat des eaux minérales existe-t-il encore en France ? *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 517-21, Évreux, 1922. ISIS

Mets, A. de. La caisse de prévoyance de l'ancienne corporation des chirurgiens-barbiers d'Anvers. *V^e^ Congrès International d'Histoire de la Médecine* (Genève 1925), p. 122-27, Genève, 1926. ISIS

Mets, A. de. Les catalogues de la corporation des chirurgiens-barbiers d'Anvers. *V^e^ Congrès International d'Histoire de la Médecine* (Genève, 1925), p. 175-79, 2 pl., Genève, 1926. ISIS

Molinéry, Raymond. Contribution à l'histoire de l'hydrologie française. Présentation de documents inédits sur la famille des BARRIÉ, de Luchon. *Bulletin de la Société française d'Histoire de la Médecine* 33, 12-17, 1939. ISIS

Molinéry, Raymond. " Le journal de Luchon " ou histoire d'une famille médicale : les BARRIÉ depuis le XVII^e siècle jusqu'à nos jours. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 511-16, 4 pl., Évreux, 1922. ISIS

Napjus, J. W. De hoogleeraren in de geneeskunde aan de hoogeschool en het athenaeum te Franeker (1585-1843). XI. PETRUS LATXNÉ. *Bijdragen tot de geschiedenis der geneeskunde* 18, 307-12, 1 pl., 1938. ISIS

Napjus, J. W. De hoogleeraren in de geneeskunde aan de hoogeschool en het athenaeum te Franeker (1585-1843). XII. ABRAHAM CYPRIANUS. *Bijdragen tot de geschiedenis der geneeskunde* 19, 8-14, 1 pl., 1939. ISIS

Tricot-Royer. Anvers nosocomial de l'an mille à nos jours. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 592-96, Évreux, 1922. ISIS

Van Loon, L. Het Rotterdamsche chirurgijnsgilde " S. Cosmos et Damianus " van 1467-1798. *Bijdragen tot de geschiedenis der geneeskunde* 19, 61-68, 7 fig., 1939. ISIS

53. — PHARMACY. PHARMACOLOGY. TOXICOLOGY

Andel, M. A. van. *Adeps hominis*, a relic of prehistoric therapy. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 190-93, Antwerp, 1923. ISIS

Bouvet, Maurice. La publicité médico-pharmaceutique dans les journaux des XVII^e et XVIII^e siècles. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 578-87, Évreux, 1922. ISIS

Bouvet, Maurice. Les échantillons de terre sigillée du Musée du Louvre. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 588-89, 1 pl., Évreux, 1922. ISIS

Brunn, W. v. Der schöne Renaissance-Erker der Ratsapotheke zu Lemgo in Lippe. *Die medizinische Welt* 13, 7 pl., 1939. ISIS

Deals with the old Lemgo pharmacy which ARNOLD C. KLEBS described in 1913 (*Isis* 1, 788). G. S.

Buchet, Charles. Essai sur l'histoire de la droguerie. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 300-13, Évreux, 1922. ISIS

Ferchl, Fritz. Illustrierter Apotheker-Kalender. 1939. Berlin, Verlag : Deutscher Apotheker-Verlag, HANS HOSEL. ISIS

" Der Illustrierte Apotheker-Kalender erscheint nach zweijähriger Pause mit dem Jahrgang 1939 bereits zum zwölften Male. Rund 1200 Bilder aus pharmazeutischer Vergangenheit sind in diesen Jahrgängen enthalten. Es gibt wohl kein Gebiet aus der Geschichte der Apotheke und der Apotheker, das nicht mehrfach bis vielfach in dieser Bildersammlung belegt ist."

Ferchl, Fritz. Chemisch-Pharmazeutisches Bio- und Bibliographikon. Herausgegeben von der Gesellschaft für Geschichte der Pharmazie. 2 Bde., 603 S. Mittenwald (Bay.), NIEMAYER, 1937-38. ISIS

Reviewed by MAX SPETER, *Isis* 30, 125-27, 1939.

Fialon, Charles Henri. Anciens statuts de la corporation des maîtres apothicaires de Lyon (1588-1595-1659). *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 221-24, Antwerp, 1923. ISIS

Foster, Michaël. The pomander stock. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 76-77, Antwerp, 1923. ISIS

Gilmour, J. P. Pharmacy in Great Britain and Ireland. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 213-20, Antwerp, 1923. ISIS

Guitard, E.-H. Histoire sommaire de la littérature pharmaceutique aux XVII^{e} et XVIII^{e} siècles. *Thalès* 3 (1936), 121-22, Paris, ALCAN, 1938. ISIS

Johnsson, J. W. S. Notice sur quelques objets de terre sigillée prétendus antitoxiques. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 282-89, 1 pl., Évreux, 1922. ISIS

Schmidt, Alfredus. De origine apothecarum. *VI^{e} Congrès International d'Histoire de la Médecine* (Leyde-Amsterdam, 18-23 juillet, 1927), p. 108-11, Anvers, 1929. ISIS

Thompson, C. J. S. The history of Hiera picra, one of the oldest known medicaments. *Proceedings of the Third International Congress of the History of Medicine* (London, July 17th to 22nd, 1922), p. 233-36, Antwerp, 1923. ISIS

Thompson, C. J. S. The pomander. A link in the history of preventive medicine. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 66-67, Évreux, 1922. ISIS

Vricot-Royer, Dr. La pharmacie du Taciturne à Anvers. *Comptes rendus du Deuxième Congrès International d'Histoire de la Médecine* (Paris, 1921), p. 590-91, 1 pl., Évreux, 1922. ISIS

Urdang, George. The idea and the tasks of the history of pharmacy. *Journal of the American Pharmaceutical Association* 27, 909-13, 1938. ISIS

VIII. — EDUCATION (the methods of accumulating, imparting and diffusing knowledge)

55. — ACADEMIES, SOCIETIES, CONGRESSES. NATIONAL AND INTERNATIONAL ORGANIZATION OF SCIENCE

(Societies and congresses devoted to particular sciences are classified under those sciences. For the internal organization of science—Isis 1, 195—*see section* 17)

Institut de France. Index biographique des membres et correspondants de l'Académie des Sciences, de 1666 à 1939. I. x+477 p. Paris, GAUTHIER-VILLARS, 1939. ISIS

L'annuaire historique de l'Académie des Sciences avait comporté de 1917 à 1937 (sauf en 1919 et 1920), un index biographique des membres et correspondants de l'Académie depuis 1795, date de la création de l'Institut national; cet index renfermait des renseignements très précieux pour l'historien. D'autre part, en 1931, par les soins de l'Institut, paraissait un volume indépendant sur *Les membres et les correspondants de l'Académie royale des Sciences* (1666-1793) supprimée, avec toutes les autres Académies, par la loi du 8 août 1793. En 1938, ces deux index étaient fondus en un seul, faisant corps avec l'annuaire de l'Académie. L'annuaire est à présent amputé de ce volumineux index; celui-ci, complété, constitue à partir de 1939 un volume spécial, dont la première édition est mise en vente. Cette brève vue d'ensemble sur les 273 années d'activité académique de quelque 2000 savants, sera extrêmement utile à l'historien de la science et au sociologue.

J. P.

Texas, Philosophical Society of. 1837-1937. Proceedings. 40 p. 1937. *Proceedings of the Centennial meetings*, 1937. 75 p. Dallas, 1938. ISIS

56. — BIBLIOGRAPHY (*methods, libraries*)

Grant, Julius. Analytical methods in the dating of books and documents. *Nature* 142, 239-41, 1938. ISIS

Schramm, J. R. Cost analysis of scholarly periodical printing. Preliminary report of the Committee on abstracting and documentation of scientific literature of the National Research Council. *Proceedings of the American Philosophical Society* 80, 24 p., 1939. ISIS

57. — MUSEOLOGY (*museums and collections*)

Hanington, Charles H. The Colorado Museum of Natural History. An historical sketch. *Proceedings of the Colorado Museum of Natural History* 17, 1-48, 13 pl., 4 fig., 1938. ISIS

An illustrated account of the foundation, organization, growth, exhibits, collections, and personnel of a museum concerned with the Rocky Mountain region, with portraits and figures of exhibits. C. A. K.

58 — CATALOGUES OF SECOND-HAND BOOKS ON THE HISTORY AND PHILOSOPHY OF SCIENCE

Many catalogues of second-hand books are so interesting and so full of valuable information that we shall henceforth register them in this section, together with other lists of a similar nature, such as catalogues of scientific medals and prints. When applying to the publishers of these catalogues for a copy, please mention *Isis*.

(Davis & Orioli). Rare books on many subjects including a remarkable collection of early books on calligraphy largely formed by a French 18th century writing master. No. 84, 35 p., 457 items. London, W.C.1, 37 Museum St. (received Dec. 1938). ISIS

(Davis & Orioli). Rare books on many subjects including a large collection of books on the history of science. Cat. 85, 31 p., 385 items. London, W.C.1, 37 Museum St. (received Feb. 1939). ISIS

(Davis & Orioli). Rare books, including an unrecorded French Bible printed by VÉRARD. Cat. 86, 42 p., 372 items. London, W.C.1 37 Museum St. (received April 1939). ISIS

(**Éditions françaises**). List 128. History of medicine and of science. 267 items. Paris, 33, Avenue des Champs-Élysées (received Jan. 1939). ISIS

(**Edwards, Francis**). Africana and orientalia 1939. Cat. no. 635, 111 p., 1710 items, London, W.1, 83, Marylebone High St. ISIS

(**Export Book Co.**). Early medical and scientific books including works by PAREY, PEMEL, SALMON, BOYLE, DARWIN, SYDENHAM, HARVEY, PRIMROSE, etc. Early manuscripts and black letter books on medical secrets. No. 303, 16 p., 276 items. Preston, England, 3 Havelock Terrace, 1939. ISIS

(**Fiedler, Henry George**). List no. 45. Periodicals and books on mathematics, physics, electricity, wireless telegraphy, technology. 16 p. New York, 31 East 10 St. (received Jan. 1939). ISIS

(**Fletcher, Ivan Kyrle**). Science, being a catalogue of books on chemistry, physics, mathematics, medicine, natural history, and occult science. Cat. 8, 20 p., 294 items. London, W.1, 26 Old Bond St., 1939. ISIS

(**Fock, Gustav**). Antiquariatskatalog Nr. 728. Der vordere Orient vom Altertum bis zur Neuzeit. Geschichte, Kulturgeschichte, Religion, Sprache, Literatur, Kunst. Hierin u. a. Teile der Bibliotheken. FRITZ HOMMEL (München) und WILHELM SPIEGELBERG (München). 177 p., 4794 items. Leipzig C.1, Sternwartenstr. 8 (received Jan. 1939). ISIS

(**Fock, Gustav**). Landwirtschaft, Pflanzenbau, Ackerbau, Tierzucht, Obst- und Gartenbau, Betriebslehre, Agrarpolitik. Antiquariatskatalog Nr. 729, 5925 items. Leipzig, C.1, Sternwartenstr. 8 (received Feb. 1939). ISIS

(**Fock, Gustav**). Reine und angewandte Chemie. Zeitschriften, Sammelwerke, Bücher und Abhandlungen. Antiquariatskatalog Nr. 725, 241 p. Leipzig, C.1, Sternwartenstr. 8 (rec'd Dec. 1938). ISIS

(**Goldschmidt, E. P.**). History of science and a few rare and important medical books. Catalogue 51. 77 p., 251 items. London, W.1, 45 Old Bond St. (received April 1939). ISIS

(**Goldschmidt, E. P.**). Bibliography. List 32. 32 p., 303 items. London, W.1, 45, Old Bond St. (received March 1939). ISIS

(**Grant, John**). Books and journals : medical, ornithology, natural history, freemasonry, geology, botany, occult, mathematics, sporting. 68 p., 1822 items. Edinburgh, 1, 31 George IV Bridge, Feb. 1939. ISIS

(**Heffer, W.**). A catalogue of books on the literature, history, religion and art of India. No. 549, 66 p., 1304 items. Cambridge, England (received April 1939). ISIS

(**Hoosier Bookshop**). Americana, first editions, medicine and miscellaneous. List 70. 219 items. Indianapolis, Indiana, 2135 North Alabama (received April 1939). ISIS

(**Hoosier Bookshop**). Medicine. Americana medica. Fundamental works selected by GARRISON for historical exhibit. Opera clinica, medical journals, miscellaneous. List 69. 175 items. Indianapolis, Ind., 2135 North Alabama (received March 1939). ISIS

(**Hoosier Bookshop**). Miscellaneous books. Americana, medicine and science, miscellaneous. List 68, 253 items. Indianapolis, Ind., 2135 North Alabama (received Jan. 1939). ISIS

(**Internationaal Antiquariaat**). History of medicine (History-autographs-biographies-portraits, etc.). Cat. no. 90. 603 items. Amsterdam-C, Keizersgracht 610 (received April 1939). ISIS

(**Internationaal Antiquariaat**). Medical books, XVth-XIXth century together with a few books on physics. Cat. no. 91. 49 p., 424 items. Amsterdam-C, Keizersgracht 610 (received April 1939). ISIS

(**Internationaal Antiquariaat**). Medical books 1500-1900, including some autographs. Cat. no. 96, 37 p., 310 items. Amsterdam-C, Keizersgracht 610 (received April 1939). ISIS

(**Internationaal Antiquariaat**). Bibliography-printing, with a special section of medical bibliographies. No. 95, 29 p., 374 items. Amsterdam-C, Keizersgracht 610 (received Jan. 1939). ISIS

(**Internationaal Antiquariaat**). List no. 218. Science (chiefly medicine-physics-botany). Amsterdam-C, Keizersgracht 610 (rec'd Feb. 1939). ISIS

(**Internationaal Antiquariaat**). English books on medicine 1550-1850 and on the history of medicine. No. 94. Amsterdam-C, Keizersgracht 610 (received Dec. 1938). ISIS

(**Junk, W.**). Catalogue of publications, fonds-catalogus, Verlags-Catalog-livres de fonds. 130 p. Den Haag, Van Bleiswijkstraat 87, 1939. ISIS

(**Kegan, Paul**). India, Burma, Ceylon, Afghanistan. A catalogue of new and second-hand books on art, archaeology, history, culture, government, politics, travels, periodicals, maps. no. 39, 112 p., London, 38 Great Russell St., 1939. ISIS

(**Lambert, Pierre**). Chez Durtal, Catalogue 24. Première partie : Livres anciens, rares ou curieux, littérature, histoire, voyages, beaux-arts, etc. Deuxième partie : Livres, plaquettes rares, documents pour servir à l'histoire des sciences. 57 p., 674 items. Paris, 12 rue Jacob, 1938. ISIS

(**Lambert, Pierre**). Chez Durtal, Catalogue 25. Livres, plaquettes rares, documents, sciences et médecine anciennes. 666 items, 56 p. Paris, 12 rue Jacob, 1939. ISIS

(**Lier, R.**). Incunabula and illustrated books. 73 items. Galluzzo (Firenze). Via S. Felice a Ema, 33, spring 1939. ISIS

(**Lier, R.**). New acquisitions of old medical books. 124 items. Galluzzo (Firenze), Via S. Felice a Ema, 33, April, 1939. ISIS

(**Lier, R.**). Old medicine and science. 185 items. Galluzzo (Firenze), Via S. Felice a Ema, 33, March 1939. ISIS

(**Low, David**). Science and technology. Cat. no. 22, 26 p., 602 items. London, W.C.2, 17 Cecil Court, Charing Cross Road (received May 1939). ISIS

(**Low, David**). Transport & communication. Cat. no. 19, 28 p., 490 items. London, W.C.2, 17 Cecil Court, Charing Cross Road (received Feb. 1939). ISIS

(**Nijhoff, Martinus**). Second-hand book department, list no. 237. International congresses and a few national congresses. 240 items. The Hague, 9 Lange Voorhout (received Jan. 1939). ISIS

(**Offenbacher, Emile**). 200 livres, anciens et rares sur la médecine et les sciences. No. 4, 32 p., 200 items. Paris (VIIIe), 10 rue Pasquier (received Jan. 1939). ISIS

(**Quaritch, Bernard**). A catalogue of books & periodicals on all classes of zoology. No. 557. 140 p., 1846 items. London, W.1, 11 Grafton St., 1939. ISIS

(**Sapir, Mrs. Jean**). Books in linguistics and philology from the library of Professor EDWARD SAPIR. I. General linguistics and Indo-European ; II. Semitic and nearby languages ; III. Other languages. p. 10-24. New Haven, Conn., 420 Whitney Ave., 1939. ISIS

(**Sotheran, Henry**). Annotated catalogue of works on chemistry, pure and applied. No. 857. 176 p., 2250 items. London, W.1, 2, 3, 4, and 5 Sackville St., 1939. ISIS

(**Thiébaud, J.**). Médecine ancienne, anatomie, chirurgie, chimie et alchimie, sciences anciennes. No. 67, 88 p., 1042 items. Paris (V), 62 rue des Écoles, février 1939. ISIS

59. — MEMORIA TECHNICA

Critical bibliography no. 57. *Isis*, vol. 31, 1939. ISIS

This note is published at the end of our bibliography solely for the convenience of the scholars who cut out the whole or part of it, attach extracts to catalogue cards and classify them. By adding this note to the others they will be able to find out rapidly whether this particular bibliography has been analyzed or not.

Isis no. 79 (vol. 29, 2). Bruges, 1938. ISIS

Isis no. 80 (vol. 30, 1). Bruges, 1939. ISIS

These nos. are analyzed in the 57th Critical Bibliography. Every previous number has been analyzed in previous bibliographies.

Osiris, vol. 5 (1938). Analyzed in the 57th Critical Bibliography. Every previous volume has been analyzed in previous bibliographies. ISIS

60. — ERRATA

Si quis Argi oculos habere posset eosque omnes diligentissime ac accuratissime intenderet in singulos versus, multa tamen eum inter corrigendum effugerent.

Isis

Vol. 27, 247. Note 6. " Reading your paper on RUMPHIUS in *Isis*, Aug. 1937, I saw the footnote (p. 247) on the ' Heeren Zeventienen.' I happen to know that this name was given to the Executive Board of the Dutch East India Company. To the ' Kamers van Zeventien ' —seventeen members—Amsterdam sent 8, Rotterdam 2, West Friesland 2, Zeeland 4 members, plus 1 elected by the last three Chambers. You see, they deserve neither oblivion nor mercy."
D. J. STRUIK.

Vol. 29, 188. Last line of SARTON's review read " one of the upper circles," instead of " the lowest circle."

Vol. 29, 191, l. 7. Instead of 1934?, read 1931. Make same correction in 24, 220, l. 13.

Vol. 29, 287, l. 1. BROCKBANK, not BROCKBAND.

Vol. 29, 18, l. 6. WILKINSON, C. K., not C. W.

Vol. 29, 510, last note, and 639. WELLCOME, not WELLCOMBE.

A few other misprints are not mentioned in these errata because they are too obvious to cause any error or confusion. I wish to express my thankfulness to the readers who take the trouble to make the above-mentioned corrections in their set of *Isis* and the *Introduction*. I would advise them, after having accomplished that little task, to write their initials near mine at the bottom of this note to indicate that these and the previous errata have been taken into account. G. S.

These and the previous errata have been corrected by.....

Index of Authors Included in the Fifty-seventh Bibliography

The Roman figures followed by (1) or (2) refer to the centurial classification (Part I); thus Alcalde, A. F. de, XV(2) means that a paper by Alcalde is listed under fifteenth century, second half.

The Arabic figures refer to the historical and to the systematic classifications (Parts II and III) which are subdivided in sections numbered consecutively from 1 to 60. For instance, Aharoni, I., 12 indicates that a paper by Aharoni is listed in section 12 (Israel); Archibald, R. C., 20 indicates that a paper by Archibald is listed in section 20 (Mathematics).

The symbols IV(a), IV(b), and IV(c) refer to the new sections on America, Oceania, and Africa at the end of Part II. For instance, Bushnell, D. I., jr., IV(a) indicates that a paper by Bushnell is listed in section IV(a), America.

June 15, 1939. FRANCES SIEGEL.

A

Adams, W. S., XIX(2)B.
Adnan, A.-ul-H., 8.
Agostini, A., XVIII(2)A.
Aharoni, I., 12.
Aiton, A. S., XVI(1)C.
Alcalde, Don A. F. de, XV(2), XVI(1)D, 50.
Alföldi, A., IV(1).
Alihan, M. A., 43.
Allberry, C. R. C., III(2).
Allee, W. C., 29.
Allen, G. M., 29.
Allen, M. W., 32.
Aly, W., I(1)B.C.
(Am. Math. Soc.), 20.
Andel, M. A. van, 40, 53.
Andrade, E. N. da C., XVII(1)E.
Anker, J., 27.
Anlicker, E., II(1).
Anschütz, R., XIX(2)B.
Arber, A., 28.
Arberry, A. J., IX(2).
Archibald, R. C., 20.
Ardill, J. R., V(1).
Ariëns Kappers, C. U., 51.
Artz, F. B., XVIII(2)B.
Aschoff, L., XIX(1)C.
Aśvaghosha, II(1).

B

Bacot, J., 8.
Baker, H. B., XX B.
Baldwin, F. G. C., XIX(2)B.

Barlow, W., XX B.
Basmadjian, K. J., 8.
Bassett, S. E., IX B.C.
Baten, W. D., 21.
Bates, D., IV(b).
Baur, P. C., IV(2).
Baynes, N. H., IV(1).
Bayon, H. P., XVII(1)D.
Beard, C. A., 43.
Beatty, L. B., 20.
(Becquerel), XIX(1)B.
Bédoret, H. (S.J.), X(1).
Beksan, F. K., XV(2).
(Belgium), 16.
Belkin, S., I(2).
Bell, E. T., XIX(2)A.
Belohlaveck, C., XVII(1)D, 6.
Beltrán, J. R., XVIII(2)D.
Benedict, R. C., 36.
Benjamin, A. C., 18.
Bennett, R. F., XIII(1).
Berence, F., XV L.
Bergsøe, P., IV(a).
Bernal, J. D., 17.
Bernardis, G. d., XVIII(2)D.
Berthelot, A., I(2)B.C., II(1).
Berthelot, M., 25.
Bertrand, L., 51.
Bevan, E., 49.
Bhattacharya, V., III(1).
Bidez, J., IV(1)B.C.
Bieber, M., 1.
(Biographie nat.), 44.
Birkhoff, G. D., XIX(2)A, 18.
Black, D., XX C.
Blake, J. W., XV(2).
Blanchet, A., 34.
Bloch, J., XV(2).
Bloomfield, L., 18.
Boardman, P. L., XIX(2)E.
Boas, F., 17, 35.
Bömer, F., V(2).
Boerhaave, H., XVIII(1)D.
Boissier, A., 3.
Bonacker, W., II(1).
Boodberg, P. A., VII(1), 10.
Bortolotti, E., XV(2), 3, 4, 20.
Botley, C. M., 33.
Botsford, G. W., 4.
Bouchacourt, L., XIX(2)D, 34.
Bouquet, H., V B.C.
Bousquet, G. H., 14.
Boutaric, A., XVIII(2)B.
Boutry, G. A., 17.
Bouvet, M., 54.
Bower, F. O., XIX(2)C, 28.
Bradford, Sir J. R., XX D.
Bradley, J. H., 18.
Brannon, P. A., 26.
Bresse, G., I(2).
Brodier, L., XVI(2)D.
Brosse, T., 9.
Brown, H., XVII(2)E.
Brown, R. R., XIX(1)C.
Brunet, L., 26.
Brunn, W. v., 54.
Bryant, L. M., XVIII(1)E.
Buberl, P., VI(1).
Buck, F., IV(a).
Buer, M. C., 51.
Buchet, C., 54.
(Buffalo), XIX(2)E.
Bugiel, V., XIV(2), 6, 40, 50, 52.
Bullock, F., 5.
Burkitt, F. C., II(1).
Bushnell, D. I., jr., IV(a).
Butterworth, G. W., III(1).

C

Caballero, R., V B.C.
Cabanès, Dr., 50.
Cadiou, R., III(1).
Caires, A. de, 49.

Callomon, F., 50.
Calverley, E. E., 14.
Campbell, D., II(2).
Camper, P., XVIII(2)C.
Cannon, W. B., XX C, 36.
Capart, J., 2.
Capparoni, P., VI(1), XI(1), XIII(2), XVI(1)D, XVII(2)D.
Carnap, R., 19.
Cassiodorus, VII(2).
Cassirer, E., XVII(1)A.
Casson, S., 4.
Castiglioni, A., XVIII(1)D, 50.
Cavallaro, V. G., 20.
Cavazzoni, L., III(2).
Cawadias, A., 4.
Cernousov, E., VI(2).
Champion, S. G., 46.
Chao, Y. R., 10.
Chapman, J., VI(1).
Charpentier, J., I(1).
Chase, C. T., 24.
Chatley, H., 2, 10.
Chauffard, A., XIX(1)D.
Childe, V. G., 9.
Chinard, G., XVIII(2)D, XIX(1)D.
Chochod, L., 10.
Christensen, A., VI(2).
Chung, K. W., 14.
Cockayne, L., XX C.
Cohen, H., 28.
Cohen, J. B., XX B.
Cohn, F., XIX(?)C.
Cole, F. J., XVII(2)C.
Coleman, T. W., XIV(1).
Collier, H. B., 10.
Collins, Sir W. J., XIX(1)D.
Comparetti, D., VI(2).
Comrie, J. D., XVIII(1)D.
Conant, J. B., 25.
Contenau, G., 3.
Cook, S. F., XVIII(2)D.
Coomaraswamy, A. K., 6.
Coon, C. S., 35.
Cornell, E. S., XIX(1)B.
Corte, M. de, IV(2).
Cortesão, A., XVI(1)C.
Cotton, A., XX B.
Courant, R., 20.
Courbon, P., XVIII(2)D, 51.
Courtney, J. W., XVII(1)D, XVIII(2)D.
Creel, H. G., 10.
Crommelin, C. A., 24.
Cross, C. F., XX B.
Crummer, Le R., XVI(1)D.
Culpin, M., 37.
Cumston, C. G., XVII(1)D.
Curtis, H. D., 31.
(Cushing, H.), XX D.

D

Dahl, F., XVII(1)E.
Dahl, S., 27.
Dalcq, A. M., 34.
Dall, N. L. G., 28.
Dalman, G., I(1).
Darlington, C. D., 27.
Darmstaedter, E., VI(1).
Darwin, C. G., 18.
Datta, B., V(2).
Daujat, J., XVII(2)B.
David, Sir T. W. E., XX C.
David-Neel, A., 9.
Davis, T. L., XI(1), 16.
De Busscher, J., XX D.
Décamps, M., 29.
Decker, A., III(1).
Dedering, S., IV(2).
Dehérain, H., XVIII(2)E.
Delahaye, K., V(1).
Delaunay, P., XVI(1)D, XVI(2)C, 27, 50, 51.

Delevsky, J., 16.
De Lint, J. G., XVIII(1)D, 6, 34.
Delmas, P., 52.
De Mets, A., XIII(1), XVII(1)D.
Derancourt, II(1).
Destouches, J. L., 24.
De Vries, H., XX C.
Dewey, J., 19.
Dickinson, H. W., 26.
Diepgen, P., V B.C., XV(2), XVI(1)D, XX D, 50.
Dijksterhuis, E. J., III(1)B.C.
Dingler, H., 24.
Dinsmoor, W. B., 23.
Dixey, F. A., XX C.
Djafar Abdel-Kader, L'Emir, 14.
Dobell, C., XIX(1)C.
Dobzhansky, T., 27.
Dooren, L., XVI(2)D.
Dorveaux, P., XVII(2)D, 52.
Douglas, J., XIX(2)A.
Dreyer, G., XX D.
Droz, E., 6.
Druce, G., 16.
Dubois, G., 32.
Du Bois-Reymond, E., XIX(1)C.
Dubreuil-Chambardel, L., XVII(1)A.
Dubs, H. H., 10.
Ducassé, P., XIX(1)A.
Duckett, E. S., VI(1).
Dudden, F. H., IV(2).
Dudley, H. W., XX C.
Dugas, R., 24.
Duhem, J., XVIII(1)B.
(Duhem, P.), 16.
Dujardin, B., XVI(2)D.
Dumas, J. B., XIX(1)B.
Dumont, P. E., 9.
Dunucé, J., XVI(1)C.
Dussaud, R., XX E.
Dyson, Sir F., XVIII(2)B.

E

Ebbell, B., 2.
Eberhard, W., 10.
Ebstein, E., XVIII(1)B.
Economo, Baroness C. v., XX D.
Edelstein, L., V B.C.
Edgar, I. I., XIX(1)D.
Einstein, A., 24.
Eliade, M., 9, 25, 28, 49.
Elkin, A. P., IV(b).
Elliott, G. R., 46.
Ellsberg, E., XIX(2)C.
Enriques, F., 18.
Evans, G. H., 51.
Evans, I. B. N., XX B.
Eve, A. S., 18.
Ewing, J. A., XX B.
Eyles, J. M., XIX(1)C.
Eyles, V. A., XIX(1)C.

F

Fabricius, J. C., XIX(1)C.
Färber, E., 25.
Fairchild, D., XX C.
Faraj, A., XII(1).
Fargues, P., IV(2).
Farmer, H. G., 14.
Feng, D. R., 10.
Ferchl, F., 54.
Fialon, C. H., XVIII(1)D, 54.
Finkelstein, L., II(1).
Firdawsi, XI(2).
Fitzgerald, C. P., VII(1).
Flaxman, E., 26.
Flaxman, N., 51.
Fleming, Sir A., XIX(2)B.
Foakes-Jackson, F. J., IV(1).
Ford, J., 43.

Fosseyeux, M., XIV(1), XVII(1)A, XVIII(2)D, XIX(1)D, 6.
Foster, M., 54.
Franklin, K. J., 36.
Frazer, Sir J. G., IV(c).
Fresa, A., XIX(2)B.
Friedenwald, H., XVI(1)D.
Frobenius, L., IV(c).
Fujikawa, W., 11.
Fuller, H. M., XVIII(1)B.
Funkhouser, H. G., 21.
Furlani, G., VII(2).

G

Gabra, S., 2.
Gager, C. S., 28.
Galen, II(2).
Gandz, S., IX(1).
Ganzenmüller, W., XIV(2), 6.
Garbedian, H. G., XX B.
Gardner, C. S., 10.
Garosi, A., XIII(1).
Gaselee, S., XII(2).
Gask, G. E., 4.
Gauss, C. F., XIX(1)A.
Gauthier, L., XII(2).
Gautier, P., XIX(1)D.
Gay, F. P., 50.
Geiger, F., I(1).
Geiser, S. W., XIX(1)C.
George, A. J., XVII(1)E, XVII(2)E.
Gibbs, F. W., 25.
Gibson, T., XVII(1)D.
Gilbert, P., IX B.C.
Gilmour, J. P., 54.
Gilruth, J. D., 4.
Ginzberg, L., 12.
Giordano, D., XVI(2)D.
Girvan, R., VII(2).
Givhan, E. G., jr., XIX(2)D.
Goddard, D., II(1).
Godeaux, L., XIX(2)A.
Gokmen, F., 24.
Gollancz, Sir H., IV(2).
Golomshtok, E. A., 39.
Gomoiu, V., 5.
Goodenough, E. R., I(1).
Goodrich, L. C., 10.
Gordon, H. L., I(2).
Gossen, H., 5.
Grant, J., 56.
Gray, A. K., XVIII(2)B.
Greenstone, J. H., 12.
Greenway, P. J., IV(c).
Greenwood, M., XVII(2)B.
Greenwood, T., XX E.
(Gregorius monachus Cyprius), IV(1).
Gregory, Sir R., 17, 49.
Gren, E., XVII(2)E.
Grøn, F., 1.
Gruen, E., XVIII(1)D.
Guéraud, O., III(1)B.C.
Guglielmini, T., XIX(2)C.
Guiart, J., 2.
Guisan, A., XVI(2)D, XVIII(1)D.
Guitard, E. H., XV(2), 54.
Gumpert, M., 16.
Gunther, R. T., XVIII(2)C.
Gutkind, K. S., XV(1).
Gwyn, N. B., XIX(2)D.

H

Haberling, W., 4.
Haddow, A., 51.
Haden, R. L., XVII(1)C.
Haefeli, L., IV(1).
Hall, J., 43.
Hall, V. E., 36.
Hamilton, C. H., IV(1).
Hanington, C. H., 57.

Hanzlik, P. J., XIX(1)D.
Harding, R. E. M., 45.
Harnack, A. v., V(1).
Harrant, M., XVIII(2)D.
Harrison, M. W., 44.
Hatch, M. H., IV(2)B.C., XIX(2)C, 16, 17.
el-Hawary, H. M., VII(2).
Hazen, A. T., XVII(2)D.
Heath, Sir T. L., 4.
Heck, N. H., 32.
Heinemann, I., I(1).
Heinemann, K., XVII(2)C.
Hellinga, G., 52.
Helm, R., IV(1).
Hemmeter, E., 2.
Henkle, H. H., 27.
Hennig, R., I(1), VI(2), 6.
Henry, P. (S.J.), III(2).
Herbe, P. M., XVIII(2)E.
Herissay, J., XVIII(2)D.
Herrick, J. B., XIX(1)D.
Hertwig, R. v., XIX(2)C.
Hertz, H., XIX(2)B.
Hesse, R., 29.
Heuten, G., IV(1).
Heyman, H. J., XVIII(2)B.
Hicks, W. M., XX B.
Hinsdale, G., XVII(1)B.
Hippocrates, V B.C.
Hobley, C. W., IV(c).
Hodous, L., 10.
Hoenigswald, R., 16.
Hofmann, J. E., XII(1), XVII(2)A.
Hoh, To-Y., 10.
Hollis, H. P., 23.
Holmbäck, A., XVIII(1)E.
Holmberg, A., XVIII(2)E.
Holmes, R. W., 48.
Holmyard, E. J., 14.
Hommel, R. P., 10.
Hooton, E. A., 43.
Hopfner, T., I(1).
Hopkins, A. J., III(2).
Hornell, J., 26.
Horner, N. G., XVII(2)D.
Horney, K., 37.
Horrell, J., XIV(2).
Hou-Jensen, H., XVII(2)C.
Hourani, G. F., 14.
Howell, A. B., 34.
Hughes, E. R., 10.
Hulshof, M. H., XV(1).
Hult, O. T., XVIII(1)B, XX D.
Humbert, P., XVII(1)B, XVII(2)B, XIX(2)A.
Hurd-Mead, K. C., 50.
Huygens, C., XVII(2)B.

I

Ibach, H., XIV(1).
Ikeguchi, K., 11.
Infeld, L., 24.
Inge, W. R., III(2).
(Institut de France), 55.
(Int'l Bibliog.), 44.
Ionides, M. G., 3.
Irissou, M., XVIII(2)D.
Issa bey, A., 14.
Iśvarakrishna, IV(1).

J

Jackson, F. J. F., I(2).
Jacobi, H., IV (1).
Jacobs, M. S., 12.
Jayle, F., 50.
Jeanselme, E., VII(1), XVII(1)C, 6, 7, 51.
Jeffrey, J. H., 8.
Jeffreys, H., 20.
Jelitai, J., XVI(2)B, XVIII(2)A, XIX(1)A, XIX(1)B.

Jensen, H., 46.
Joannides, D., XI(2).
Johnson, T. H., XVII(2)E.
Johnsson, J. W. S., XVI(1)D, 28, 40, 53.
Jones, H. W., XIX(1)D, 52.
Jorge, R., XVI(2)D, 50.
Josephus, F., I(2).
Jouguet, P., III(1)B.C.
Jouniaux, A., 25.
Junk, W., 15.
Jurdâq, M., 14.
Juwaynī, ʿAlī-ud-Dīn Atā Malik-i., XIII(1).

K

Kamil, M., 12.
Kanakura, Y., 8.
Kantorowicz, H., XII(1).
Kapferer, R., V B.C.
Karpinski, L. C., XVII(1)A.
Kast, L., 17.
Katsainos, G. M., 51.
Katz, D., 43.
Kawase, K., 11.
Keil, H., XVIII(2)D.
Keimer, L., 2.
Kemp, J., XVIII(2)E.
Kennelly, A. E., 24.
Kenney-Herbert, A., V B.C.
(Keogh, A.), XX E.
Kepler, J., XVII(1)B.
Keyser, C. J., XIII(2).
Kheirallah, G. I., 14.
Kilborn, L. G., 10.
Kilgour, F. G., XVIII(1)B, XVIII(1)E.
Kilmer, F. B., XVII(2)D.
Kleim, J. A., XIX(1)B.
Kleiner, I. S., XVIII(2)B.
Knopf, O., 23.
Köstermann, E., IV(2).
Korns, H. M., 50.
Krachkovski, I. J., 14.
Kraus, C. A., XIX(2)A.
Krause, M., I(2).
Kretzmann, E. M. J., 26.
Krickeberg, W., IV(a).
Kristeller, P. O., XV(2).
Krogman, W. M., IV(a).
Kroon, J. E., XVI(2)D.
Kross, S. L., X(2).
Krumbhaar, E. G., XVII(1)D.
Ku Chieh-Kang, 10.
Kubitschek, W., II(1).
Kure, S., 11.
Kuwabara, J., XIII(2).

L

Lachièze-Rey, P., IV(1)B.C.
Lacroix, A., XVIII(2)C, XIX(2)C, 16.
Lacroix, L., 4.
Ladeuze, Mgr. P., XX C.
Laignel-Lavastine, XVI(2)D, XVII(1)D, XVIII(1)D, XVIII(1)E, 34, 50.
Lake, K., I(2).
Lalou, M., 8, 9.
Lamb, Sir H., XX A.
Lander, K. F., 34.
Landtman, G., 35.
Langer, R. E., XIX(2)A.
Lankhout, J., XVII(2)E.
Lapan, A., 18.
Lapicque, L., XX C.
La Roncière, C. de, 31.
Laubry, C., 9.
Laufer, B., 28.
Launay, L. de, XIX(1)B.
La Vallée Poussin, L. de, IV(1), VII(1).

Lavoisier, A. L., XVIII(2)B.
Lecène, P., V B.C.
(Le Chatelier, H.), XIX(2)B.
Leclerc, H., XVI(2)C, 28.
Le Gendre, P., XIX(2)D.
Lehmann, H., 28.
Leichtentritt, H., 45.
Lejeune, A., III(1)B.C.
Lejeune, F., XVI(1)D.
Lévi, S., II(1).
Levy, R., XIV(1).
Lichtenstädter, I., IX(1).
Lietzmann, H., V(1).
Linckenheld, E., I(2).
Lindsay, Prof., IV(1)B.C.
Lindsay, L., XVII(2)D, 50.
Lindsay, R. B., 24.
Lin Li-Kouang, VII(2).
Linné, S., 28.
Lint, J. G. de, XVIII(2)D, 2.
Lippmann, E. O. v., XVIII(2)B, XIX(1)B.
Liu, C. H., 10.
Liu, G., 10.
Livet, 34.
Livingston, D. F., XVII(1)E.
Livingston, R., 25.
Loomis, C. G., 6.
Lopes, F. F., XVI(1)C.
Loria, G., 20.
Lowie, R. H., 40.
Luck, J. M., 36.
(Luther, M.), XVII(2)E.
Lutz, H. L. F., 3.

M

Maas, P. L., 4.
MacDermot, H. E., XIX(2)D.
MacCurdy, E., XV L.
Macleod, J. J. R., XX C.
MacPike, E. F., XVII(2)B.
Madsen, V., XV(2).
Magnes, J. L., 12.
Mahnke, D., 20.
Major, R. C., IV(a).
Major, R. H., XVII(1)E, XIX(2)D
Malisoff, W. M., 18.
Mallat, A., 52.
Mandonnet, P. F., XIII(1).
Marchal, E., XX C.
Margerie, E. de, XIX(2)C, 16.
Mariadassou, P., 9.
Mariès, L., III(1).
Marrou, H. I., V(1).
(Marvin, F. S.), 16.
Mauclaire, P., XVIII(1)D.
Mauriac, P., XIX(2)C.
Maxey, C. C., 43.
Mayer, C. F., 6.
Mayrhofer, B., XX D.
Mazeran, A., 5.
McCarthy, J. S., XVII(2)B.
McColley,G., XVII(1)B, XVII(1)E, XVII(2)B.
McCrea, W. H., 22.
McDaniel, W.B.,(2nd), XVIII(2)D.
McGeachy, J. A., jr., VIII(2).
McKenzie, D., 39.
McKie, D., XVIII(2)B, 25.
McLennan, Sir J. C., XX B.
(Med., hist. Cong. XI), 50.
Melmore, S., XVII(2)B.
Melson, E. W., XIX(1)C.
Ménétrier, P., XVI(2)D, XVIII(1)D, XIX(1)D, 34.
Mercier, L., XIV(2), 2.
Merril, E. D., 8.
Merton, R. K., XVII(1)E, 43.
Mesnil du Buisson, Le Comte du, 3.
Messerli, M., 51.
Mets, A. de, 52.
Mettler, C. C., XIX(1)D.
Metzger, H., 25.

Meyer, A. W., XIX(1)C.
Meyerhof, M., II(1), IX(2), XI(2), 14.
Michel, H., XVII(1)B.
Middleton, W. S., XVIII(2)D.
Mieli, A., XVII(1)B.
Miller, H., XIX(1)C, 16.
Miller, P., XVII(2)E.
Mingana, A., VII(2).
Mittasch, A., 25.
Mørland, H., II(1).
Moghadam, M. E., 14.
Molinéry, R., 52.
Monceaux, P., IV(2).
Moon, R. O., XVI(1)D.
Moreland, W. H., XV(2).
Morey, Dom A., XII(2).
Morgan, Sir G. T., 25.
Morgan, J., V(1).
Moore, W. D., 26.
Morisset, Dr., 51.
Moule, A. C., XIII(2).
Moulé, L., XVIII(1)D, 51.
Moutier, F., XVI(1)D, 50.
Mozolowski, J. S., XIX(1)D.
Müller-Graupa, E., 29.
Muller, J. A., 10.
Murphy, Sister M. G., IV(2).
Murray, H. A., 37.
Myers, J. G., 29.

N

Nagel, E., 18, 21.
Napjus, J. W., 52.
Nemoy, L., XV(2).
Neugebauer, O., I(1)B.C., 2.
Neurath, O., 18.
Neveu, R., 4, 5, 51.
Neville, E. H., 22.
Newbury, N. F., 26.
Newell, E. T., 8.
Newhall, B., 24.
Newman, H. H., 29.
Nicaise, V., 34.
Nicholson, J. A., 48.
Nicol, J., I(2).
Nielsen, J. R., XIX(1)B.
Nierenstein, M., XVII(2)B.
Nieuwenhuis, A. W., 40.
Nobel, J., V(1).
Norman, D., 23.
Nuttall, G. H. F., XIX(2)C.
Nykl, A. R., VII(1).

O

Oeconomos, L., 7.
Oehser, P. H., XIX(2)C.
Oesterle, F., XVI(1)D.
Ogawa, K., 11.
Ogden, M. S., XV(1)
Ogura, K., 11.
Okulicz, L., II(1).
Oliaro, T., VII(1).
Oliver, J. H., 4.
Olmstead, A. T., 3.
Olmsted, J. M. D., XIX(2)C.
Oribasius, IV(2).
Orr, W. McF., XX A.
Otto, E., 2.
Ovid, I(2)B.C.
(Oxford Museum of the Hist. of Sci.), 16.

P

Palanque, J. R., IV(2).
Panayotatou, A. G., 4.
Panayotatou, D., V B.C.
Paoli, H. J., XIV(2).
Parry, T. W., 39.
Partington, J. R., XVIII(2)B, 25.
Partridge, E., 46.

Patch, H. R., VI(1), XIV(1).
Patterson, M., XVIII(1)E.
Patterson, T. S., XIX(1)B.
Pazzini, A., 50.
Pearl, R., 43.
Peattie, D. C., 29.
Peeters, P., V(1).
Pellett, F. C., 29.
Pelliot, P., XIII(2).
Pelseneer, J., XVII(2)A, 16, 23.
Pembrey, M. S., XX C.
Penzer, N. M., XIII(2).
Pergameni, C., XVIII(2)D.
Petridis, P., XIX(2)D.
Peyer, A. de, XVII(2)D.
Peyre, P., 28.
Pickman, E. M., V(1).
Pietsch, E., 25.
(Piltdown man discovery), XX C.
Pina, L. de, 31, 50.
Pines, S., XII(2), 14.
Plantier, L., XVII(1)D.
Pliny, the Elder, I(2).
Poidebard, A., 1.
Polain, M. L., XV(2).
Poleman, H. I., 9.
Pollnow, H., 37.
Power, Sir D'A., XVII(1)D, XVIII(1)D.
Poynton, F. J., XVIII(2)B.
Pratt, C. C., 37.
Pratt, D., 25.
Proclus, V(2).
Przyluski, J., 13.
Ptolemy, C., II(1).
Puech, A., I(1)B.C., IV(1).
(Purdue Univ.), 16.

Q

Quignon, G., XIX(2)B.
Quinan, C., 40.

R

Ramon y Cajal, S., XX C.
Rappaport, S., I(2).
Rauther, M., XIX(1)C.
Rawdon-Smith, A. F., 37.
Raymond, I. W., V(1).
Raymond, P., 6, 28.
Raymond, P. E., 39.
Read, J., XIII(1).
Reclus, E., 28.
Regiomontanus, XV(2).
Regnault, F., 51.
Renaud, H. P. J., XII(1), 14.
Renaud, P., 24.
Rhys Davids, C. A. F., 9.
Ricci, S. de, XVI(1)C.
Richter, J. P., XV L.
Riggs, A. S., 44.
Ritter, J., V(1).
Ritter, W. E., 29.
Robertson, W. G. A., XIII(2).
Robinson, C. A., jr., 4.
Robinson, V., 50.
Robson, J., IX(2).
Roche, P. Q., 9.
Römer, L. S. A. M. v., XVII(1)D.
Rogosin, H., 37.
Rolleston, J. D., IV(1), XVIII(2)D.
Rome, A., 7.
Rooseboom, M., XVII(2)B.
Rosen, G., XIX(1)D, XIX(2)D.
Rosett, J., 37.
Ross, Sir E. D., XVII(1)E.
Roth, G. B., XIX(2)D.
Rousset, J., XVIII(2)D.
Rouzaud, A., XIX(2)D.
Rudbeck, O., XVII(2)E.
Ruska, J., XII(1), XX B, 16.
Russell, A., XIX(2)B.

S

Sachse, W. L., XVII(2)E.
Sait, U. B., 43.
Sakanishi, S., 10.
Sallustius, S. S., IV(2).
Saltykow, M. N., XVII(1)A.
Sanda, A., VI(1).
Sandow, A., XIX(2)C.
Santillana, G. de, 48.
Sardesai, R. N., 9.
Sarton, G., XI(1), XV(2), 16, 20.
Sastri, P. S. S., 9.
Sayili, A. M., IV(2)B.C.
Sbath, P., IX(2).
Schanck, R. L., 43.
Scheil, V., 3.
Schiaparelli, G. V., XIX(2)B.
Schiffer, S., 3.
Schimank, H., 24.
Schlichting, T. H., XVI(1)E, 36.
Schliemann, H., XIX(2)E.
Schloessinger, M., IX(2).
Schmidt, A., 54.
Schöne, H., IV(2).
Scholderer, V., XV(2).
Schramm, J. R., 56.
Schrecker, P., XVII(1)A, XVII(2)E.
Schütze, K., II(2).
Schuhl, P. M., I(2)B.C.
Schurr, V., VI(1).
Schuster, Sir A., XX B.
Schwartz, B., XVII(2)E.
(Sci. and Society), 17.
(Science Museum, London), 15, 16.
Seifriz, W., XIX(1)C.
Séjourné, Dom P., VII(2).
Seligmann, Général, 31.
Sergescu, P., 16.
Seston, W., III(1).
Sévilla, H. J., IV(1), 4.
Shapiro, H. L., 43.
Sharpey-Schafer, Sir E. A., XX C.
Shimoyama, J., 11.
Shoen, H. H., XIX(2)E.
Short, A. K., 28.
Shorter, A. H., 26.
Shryock, R. H., 50.
Siebold, P. F. v., 11.
Sigerist, H. E., XVIII(1)D, 6.
Silk, E. T., VI(1).
Silverstone, A. E., II(1).
Silvette, H., XVII(1)E.
Simonini, R., 6.
Simpson, L. B., XVIII(2)C.
Simpson, Sir W. J. R., 51.
Singer, C., XIV(2).
Singer, D. W., V B.C., 25.
Sinha, J., 9.
Slichter, C. S., 16.
Smith, Sir F., 50.
Smith, T., XX D.
Smythe, J. A., 5.
Soothill, W. E., 10.
Spanopulos, G., XIX(1)D.
Speleers, L., 3.
Speter, M., XIX(2)B, XIX(2)D.
Sprague, T. A., I(2).
Stapelmohr, I. von, XIV(1).
Staples, W. E., III(1).
Stark, J., 18.
Stcherbatsky, T., VII(2).
Stearns, M. W., XV(2).
Steche, T., II(1).
Stefansson, V., 16.
Stein, Sir A., 13.
Stein, E., I(1).
Stein, J., V(2).
Stern, A., 48.
Sturge, C., XVI(1)A.
Sudhoff, K., XX D, 6.
Suzuki, M., 8.
Svennung, J., IV(1), IV(2).
Svoboda, K., I(2).

Swain, J. E., 44.
Swinnerton, A. C., XIX(2)C.
Sylvia, E., XVI(1)C.
Synesius, V(1).
Szumowski, W., XVIII(2)D.

T

Tacitus, I(2).
Tada, T., 8.
Taft, R., 26.
Tallmadge, G. K., XVI(2)D, XVI(2)E.
Tandberg, J., XIX(1)B.
Tannehill, I. R., 33.
Taube, M., 48.
Taylor, F. S., 16.
Téchoueyres, E., 9.
Têng Ssŭ-yü, 10.
Ternowsky, W. N., XVII(2)D.
(Texas, Phil. Soc. of), 55.
Theodore of Mopsuestia, IV(2).
Thierfelder, A., II(1).
Thomas, H., XVI(1)C.
Thomas, H. H., XX C.
Thomas, J., XVIII(2)E.
Thompson, D'A. W., IV(1)B.C.
Thompson, C. J. S., 51, 54.
Thomson, E., XIX(2)B.
Thomson, S. H., XIII(1), 6.
Thorndike, L., XVII(1)D, 6.
Thureau-Dangin, F., 3.
Tietsch, F. L., XX D.
Tjomsland, A., XVII(2)C.
Tolkowsky, S., 28.
Torkomian, V. H., XIX(2)D, 8, 51.
Torrey, H. B., XVII(1)D, 4.
Townsend, J. M., XIX(2)D.
Tricot-Royer, 52, 54.
Trzebinski, S., XVIII(2)D.
Tucci, G., III(1), IV(2).
Turnbull, H. W., XVII(2)B.
Tushnet, L., 50.

U

Ünver, A. S., XIV(1), 40.
Uhden, R., I(2)B.C., II(1).
Ui, H., 8.
Unger, F. C., V B.C.
Urdang, G., 54.
Usaibi'a, Ibi abī, XIII(1).

V

Vallentin, A., XV L.
Van Andel, M. A., XIX(1)D.
Van den Dungen, F., 16.
Van der Kley, J. J., XIX(2)D.
Van Der Leeuw, G., 49.
Vandevelde, A. J. J., XVII(1)E.
Van Esso, I., 50.
Van Gils, J. B. F., XVII(1)D.
Van Gulik, R. H., XI(2).
Vanhée, L., III(1)B.C.
Van Loon, L., 52.
Van Mieghem, J., XX B.
Van Schevensteen, A. F. C., XVI(2)D, XVIII(1)D, 28, 40.
Van Seters, W. H., XVII(2)C.
Van Steenberghen, F., XIII(2).
Variot, G., XVIII(2)D.
Ventura, A. F. G., XVI(1)D.
Ver Eecke, P., III(2), 4.
Vercel, R., 31.
Vermilye, W. M., 26.
Vernadsky, G., XIII(1).
Vetter, Q., 16.
Vietmeier, K., V(1).
Viets, H. R., 50.
Villaret, M., IX(2), XVI(1)D, 50.
Vincent of Beauvais, XIII(2).
Vinchon, J., XVI(2)D, XVIII(1)D, 50.

Vogel, K., 20.
Volta, L., XVIII(2)A.

W

Wachsmuth, B., 50.
Walde, O., XVI(1)B.
Walker, E. H., 8.
Walker, Sir J., XX B.
Wallquist, E., XX D.
Walsh, J., II(2).
Walter, E., 16, 33.
Walzer, R., II(2).
Wang Tch'ang-tche, XVI(1)E.
Wasiutyński, J., XVI(1)B.
Weil, E., XIX(2)B.
Weiss, P., 34.
Wellmann, M., I(2), II(2).
Wen-jen, L., 8.
West, G., XIX(2)C.
Weve, H., 24.
Wethered, H. N., I(2).
Weynants-Ronday, M., 2.
White, L. A., 18.
White, W., XIX(2)D, XX D.
Whitrow, F. J., XVII(2)B.
Wickersheimer, E., XIII(1), XIV(1).
Wiener, N., 20.
(Wier, J.), XVI(2)D.
Wierzbicki, R., XIX(1)D.
Wiki, B., XVIII(2)D.
Wilson, R. S., II(1).
Winter, H., 24.
(Winthrop Soc.), 16.
Wissler, C., IV(a).
Withington, E. T., II(2).
Wolff, G., 34.
Wood, H. O., 32.
Woodruff, F. W., XIII(2).
Woodworth, R. S., 37.
Woog, P., 2.
Woolley, L., V(1).
Worthington, E. B., IV(c).
Wright, E. A., 6.
Wright, G. E., 12.
Wright, W., XV L.
Wright, W. B., 39.
Wrzosek, A., XVIII(2)D, XIX(1)D.

Y

Young, W. A., 11.
Yün-Ts'ung, C., XI(2).

Z

Zaki-Ali, Dr., XI(1).
Zaloziecky, W. R., VI(1).
Zaunick, R., XIX(1)C.
Zekert, O., XVI(2)D.
Zibordi, F., 1.
Zinner, E., XV(2).
Zosimos, III(2).